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NUEXCO

Monthly Report

December 1989 Number 256

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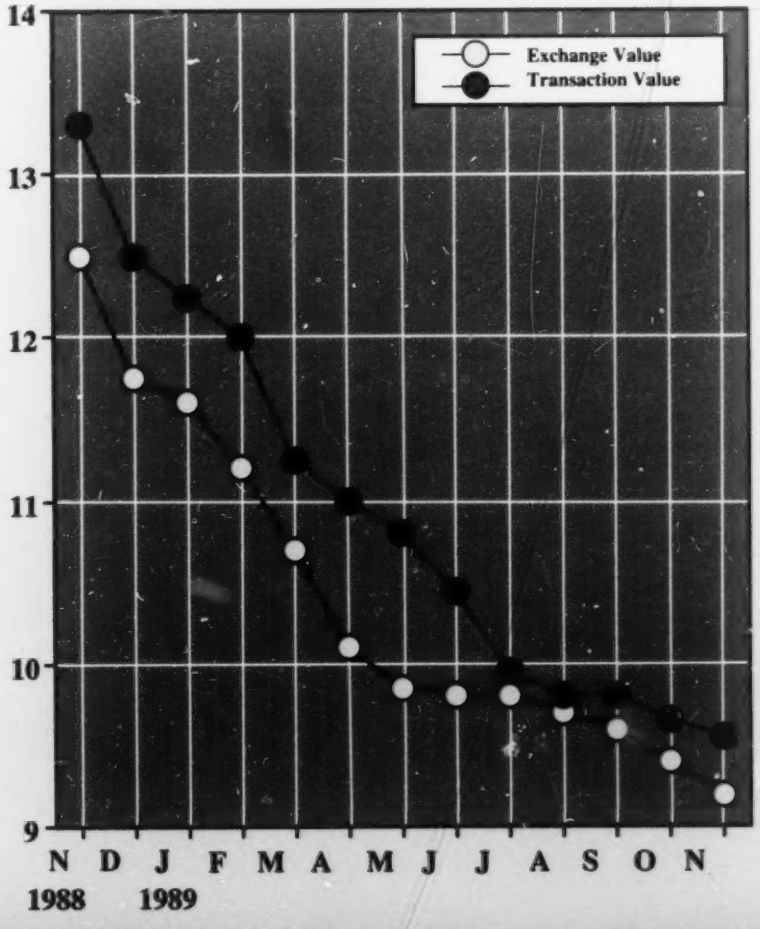

NUEXCO

INTERNATIONAL HEADQUARTERS

Three Park Central, Suite 900
1515 Arapahoe Street
Denver, Colorado 80202 USA

Telephone: (303) 899-4500
Telecopy: (303) 899-4555
Telex: 450202 (NUEXCO)

SERVICE LOCATIONS

DENVER, COLORADO, USA

Three Park Central, Suite 900
1515 Arapahoe Street
Denver, Colorado 80202
Telephone: (303) 899-4500
Telefax: (303) 899-4555
Telex: 450202 (NUEXCO)

WASHINGTON, D.C., USA

11 Dupont Circle, Suite 505
Washington, D.C. 20036
Telephone: (202) 328-9250
Telefax: (202) 328-6699
Telex: 248253 (NUEXCO DC)

ZURICH, SWITZERLAND

Leberngasse 15
4603 Olten
Switzerland
Telephone: (41-62) 320032
Telefax: (41-62) 321450
Telex: 981600 (NUXCH)

SAN FRANCISCO, CALIFORNIA, USA

Building 1, Suite 105
3000 Sand Hill Road
Menlo Park, California 94025
Telephone: (415) 854-1510
Telefax: (415) 854-2115
Telex: 470674 (NUEXCO SF)

HONG KONG

1403 Shui On Centre
6-8 Harbour Road, Wanchai
Hong Kong
Telephone: (852-5) 865-1418
Telefax: (852-5) 865-2721
Telex: 67206 (CNITC)

GENEVA, SWITZERLAND

13 chemin du Levant
01210 Ferney-Voltaire
France
Telephone: (33-50) 428035
Telefax: (33-50) 428526
Telex: 385288 (NUEXCO F)

SERVICE ENTITIES

NUEXCO (Headquarters)	Oren L. Benton, Chief Executive Officer
NUEXCO International Corporation	Charles H. Peterson, President
NUEXCO Trading Corporation	Earl E. Hoellen, President
NUEXCO Exchange AG	Hans W. Vogt, Managing Director
NUEXCO Information Services Company	Charles H. Peterson, President
NUEXCO Asia, Limited	Gerald L. Murdock, Managing Director

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Managing Editor:
R. Wesley Miller

Director-Market Analysis:
Treva E. King

Editor:
France Addington-Lee

Supply Analysis:
Thomas C. Pool

Demand Analysis:
John M. Vallance

Market Analysis:
David S. Schramm

Research Services:
Carolyn B. McCants

Subscription Services:
Lori C. Mattics

Washington Focus:
Linda L. Gunter

Published by:
NUEXCO
Three Park Central, Suite 900
1515 Arapahoe Street
Denver, Colorado 80202
Telephone: (303) 899-4500
Telefax: (303) 899-4555
Telex: (303) 450202 (NUEXCO)

Other NUEXCO Publications:
Annual Review, Uranium Market Study; International Directory of Nuclear Utilities (IDNU), International Directory of Uranium Producers (IDUP)

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To Our Readers

We are pleased to announce that Mr. **Kenten D. Lindberg** has joined the NUEXCO organization.

Kent obtained his Bachelor of Science degree in Industrial Engineering from Purdue University and a Masters in Business Administration from Washington State University. He held various production management positions with Boise Cascade Corrugated Container Division, and was responsible for the operation of a high-volume production plant. Previously, Kent was a sales engineer for Reliance Electric Company. Kent has worked in West Germany, and also attended an intensive language and cultural program in China.

Kent is the grandson of Harold (Lindy) Lindberg, NUEXCO's representative to many of the Eastern US utilities. Based in Denver, Kent will work with the NUEXCO publications group.

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MARKET VALUES SUMMARY

November 30, 1989	Market Values	Active Supply* (thousands)	Active Demand* (thousands)
EXCHANGE VALUE[1]	$9.20/lb U_3O_8	8,310**	2,645**
UF_6 VALUE[2]	$27.75/kg U as UF_6		
LOAN RATE[3]	3.5%/annum	7,660	0
CONVERSION VALUE[4]	$1.75/lb U as UF_6	2,120	0
SWU VALUE[5] 0.3 tails assay:	$57/SWU	980	400

	$/lb. U_3O_8	Millions of Pounds	Number of Transactions	Number of Months
TRANSACTION VALUE[6]	9.55	3.5	17	3

*Supply and demand tables in the *Current Market Data* section of this Report detail the numbers for each category.
**For both uranium concentrates and uranium hexafluoride.

DEFINITIONS

[1] The **Exchange Value** is Nuexco's judgment of the price at which transactions for significant quantities of natural uranium concentrates could be concluded as of the date indicated.

[2] The **UF_6 Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of natural uranium hexafluoride could be concluded as of the date indicated.

[3] The **Loan Rate** is Nuexco's judgment of the annual interest rate at which uranium loans could be concluded as of the date indicated.

[4] The **Conversion Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of conversion services could be concluded in the secondary market as of the date indicated.

[5] The **SWU Value** is Nuexco's judgment of the price at which spot and near-term transactions for significant quantities of enrichment services could be concluded as of the date indicated.

[6] The **Transaction Value** is a weighted average price of recent natural uranium sales transactions. The calculation is based on prices paid in:
a. Transactions closed within the previous three month period for which delivery is scheduled within one year of the transaction date;
b. At least ten transactions;
c. Transactions involving a sum total of at least 2 million pounds U_3O_8 equivalent.
The sample time is extended as necessary to include these minima. Other currencies are converted to US dollars using conversion rates in effect on or near the transaction date.

DERIVATIONS AND COMMENTS

- All Market Values are based on:
  - Data from recently completed transactions.
  - Data from pending transactions.
  - Firm bids to buy or borrow, and firm offers to sell or lend.
  - Prices purchasers or rates borrowers have expressed a willingness to pay, but for which Nuexco is not aware of firm bids to buy or borrow, and prices sellers or rates lenders have expressed a willingness to accept, but for which Nuexco is not aware of firm offers to sell or lend.
- Prices associated with deliveries under old or renegotiated contracts or other than arm's-length transactions are not included in the determination of these Market Values.
- In the determination of prices, Nuexco does not consider transportation charges other than those customarily provided by suppliers.
- The prices of services or materials delivered under long-term contracts with primary suppliers are not considered in the determination of the listed values.
- For the SWU Value, Nuexco converts SWU prices at varying tails and product assays to equivalent SWU prices at a tails assay of 0.30 weight percent U^{235} and a product assay of 3.0 weight-percent U^{235}, assuming feed costs corresponding to the Nuexco Exchange and Conversion Values determined as of the same date.
- In calculating the Transaction Value, Nuexco does not account for the price of uranium delivered in connection with contracts which call for "market price" mechanisms. This exclusion applies particularly to contracts in which delivery prices are expressed as a function of future Exchange Values or any other indeterminate variable. Also excluded from the calculation are any other transactions in which the delivery price is defined in such a way that it cannot currently be determined.

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NATURAL URANIUM AND SPOT CONVERSION

(All data as of November 30, 1989)

Spot market volume for uranium sales doubled from last month to 2.2 million pounds U_3O_8 equivalent. This figure includes four U_3O_8, two UF_6, and two enriched uranium product sales, almost all of which involved US parties. Lending activity was limited to one transaction. Two conversion sales took place, and three enrichment sales are reported, two of which involved SWU contained in enriched uranium product (EUP).

Natural uranium concentrate prices declined in November with each successive sale, and at the end of the month the **Exchange Value** dropped $0.20 to **$9.20** per pound U_3O_8. Four U_3O_8 transactions occurring in November are reported, and all involved US entities, with the exception of one seller based in Europe. Each sales opportunity elicited aggressive pricing from both producers and traders.

The Recent Transactions table on page six of this Report lists four additional near-term U_3O_8 sales which occurred earlier in 1989. Consequently, they are excluded from this month's sales volume figure.

Decisions are expected shortly from several utilities currently evaluating U_3O_8 offers for near-term delivery priced near today's Exchange Value, while a handful of utilities are considering long-term proposals.

* * *

The **UF_6 Value** registered a $0.50 decline from last month to **$27.75** per kgU as UF_6. Intermediaries acted as sellers in the two reported UF_6 transactions, both of which were concluded at prices at or near the new UF_6 Value. Uranium contained in EUP accounted for about one third of the sales activity. There is a widespread perception that the UF_6 market is not only oversupplied, but that this imbalance will worsen in the coming months. Inventories held in the form of UF_6, both natural and enriched, are being forced into the market, and the expected liquidation of one US utility's inventory of more than one million pounds equivalent will also increase the supply excess.

* * *

Since last month, **Active Supply** increased by about 400 thousands pounds to **8.3 million pounds** U_3O_8 equivalent, its highest level since January. Demand for U_3O_8 and UF_6, however, has decreased substantially (almost 50 percent) since last month as a number of buyers filled firm and discretionary requirements, and only a few new buyers have shown interest in taking first quarter 1990 deliveries. The November purchases did little to clear the market of excess supplies of natural uranium. The new **Supply/Demand Ratio** increased to **3.1 to 1**, compared to 1.3 to 1 in October.

Namibia completed its first national elections early in November, and it is expected that US sanctions against Namibian uranium imports will be lifted early in 1990. If so, the availability of Namibian-origin material could increase competition for those opportunities involving purchasers who were previously barred from purchasing Namibian uranium.

* * *

The **Transaction Value** fell $0.10 to **$9.55**. Its calculation includes 17 transactions occurring over three months and totalling approximately 3.5 million pounds U_3O_8 equivalent.

* * *

The **Loan Rate** is unchanged at **3.5 percent** per annum. One loan is reported, involving a number of special circumstances including changes in location and origin. One other loan is in negotiation.

* * *

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Under pressure from the large supplies of UF_6 overhanging the market, the **Conversion Value** declined $0.05 to **$1.75**. Two conversion transactions are reported this month, one in the USA and one in Europe. In addition, one long-term sale, which was concluded earlier in 1989, is shown in the page 7 conversion transactions listing.

Competition among US and European converters in the spot market continues to exert downward pressure on near-term conversion prices. As a result, over the past few months the gap between European and US conversion prices has disappeared. Several utilities are evaluating long-term conversion offers, with decisions expected soon.

ENRICHMENT

In an unusually active month, the **SWU Value** fell 3.4 percent to **$57** per SWU, and active supply and demand both decreased. A US utility purchased a small quantity of SWU, while two other US entities bought SWU contained in EUP. One of these utilities is again seeking SWU, for delivery in late 1990. Secondary market supplies of SWU and EUP remain plentiful and there is a high probability that additional material will be available in 1990.

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CURRENT MARKET DATA

EXCHANGE VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb U_3O_8 as Concentrates			per kg U as Concentrates		
	This Month (Nov 30, 1989)	Last Month (Oct 31, 1989)	12 Months Ago (Nov 30, 1988)	This Month (Nov 30, 1989)	Last Month (Oct 31, 1989)	12 Months Ago (Nov 30, 1988)
Australia (dollar)	11.79	12.01	14.27	30.66	31.21	37.10
Belgium (comm. franc)	345.48	362.24	454.26	898.16	941.73	1,181
Canada (dollar)	10.73	11.03	14.93	27.89	28.68	38.81
EEC (ecu)	8.05	8.42	10.44	20.93	21.89	27.13
Finland (markka)	38.62	39.93	51.29	100.41	103.81	133.35
France (franc)	56.10	58.57	74.10	145.84	152.26	192.63
FRG (mark)	16.45	17.25	21.69	42.76	44.84	56.39
Italy (lira)	12,131	12,663	16,046	31,537	32,922	41,717
Japan (yen)	1,314	1,334	1,524	3,417	3,468	3,962
Netherlands (guilder)	18.55	19.47	24.41	48.22	50.61	63.47
South Africa (rand)	23.93	24.73	29.06	62.22	64.29	75.54
Spain (peseta)	1,060	1,098	1,418	2,755	2,855	3,685
Sweden (krona)	58.67	60.22	75.39	152.53	156.55	196.00
Switzerland (franc)	14.65	15.10	18.13	38.08	39.25	47.15
UK (pound)	5.88	5.94	6.78	15.28	15.45	17.62
US (dollar)	9.20	9.40	12.50	23.92	24.44	32.50

TRANSACTION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb U_3O_8 as Concentrates			per kg U as Concentrates		
	This Month (Nov 30, 1989)	Last Month (Oct 31, 1989)	12 Months Ago (Nov 30, 1988)	This Month (Nov 30, 1989)	Last Month (Oct 31, 1989)	12 Months Ago (Nov 30, 1988)
Australia (dollar)	12.24	12.32	15.18	31.83	32.04	39.47
Belgium (comm. franc)	358.62	371.87	483.34	932.33	966.78	1,257
Canada (dollar)	11.14	11.32	15.88	28.95	29.44	41.30
EEC (ecu)	8.36	8.64	11.10	21.72	22.47	28.87
Finland (markka)	40.09	40.99	54.58	104.23	106.58	141.88
France (franc)	58.23	60.12	78.84	151.39	156.31	204.96
FRG (mark)	17.07	17.71	23.08	44.38	46.03	60.00
Italy (lira)	12,592	13,000	17,073	32,737	33,797	44,386
Japan (yen)	1,364	1,369	1,622	3,547	3,560	4,216
Netherlands (guilder)	19.25	19.99	25.98	50.06	51.96	67.53
South Africa (rand)	24.84	25.39	30.92	64.59	66.00	80.37
Spain (peseta)	1,100	1,127	1,508	2,860	2,930	3,921
Sweden (krona)	60.90	61.82	80.22	158.33	160.72	208.55
Switzerland (franc)	15.20	15.50	19.29	39.53	40.30	50.16
UK (pound)	6.10	6.10	7.21	15.86	15.86	18.75
US (dollar)	9.55	9.65	13.30	24.83	25.09	34.58

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on the last working day of the month.

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CONVERSION VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

Country (currency)	per lb U as UF_6			per kg U as UF_6		
	This Month (Nov 30, 1989)	Last Month (Oct 31, 1989)	12 Months Ago (Nov 30, 1988)	This Month (Nov 30, 1989)	Last Month (Oct 31, 1989)	12 Months Ago (Nov 30, 1988)
Australia (dollar)	2.24	2.30	2.23	4.95	5.07	4.91
Belgium (comm. franc)	65.72	69.36	70.87	144.88	152.92	156.23
Canada (dollar)	2.04	2.11	2.33	4.50	4.66	5.13
EEC (ecu)	1.53	1.61	1.63	3.38	3.55	3.59
Finland (markka)	7.35	7.65	8.00	16.20	16.86	17.64
France (franc)	10.67	11.21	11.56	23.52	24.72	25.48
FRG (mark)	3.13	3.30	3.38	6.90	7.28	7.46
Italy (lira)	2,307	2,425	2,503	5,087	5,346	5,519
Japan (yen)	250.00	255.43	237.75	551.16	563.12	524.14
Netherlands (guilder)	3.53	3.73	3.81	7.78	8.22	8.40
South Africa (rand)	4.55	4.74	4.53	10.04	10.44	9.99
Spain (peseta)	201.57	210.26	221.14	444.38	463.53	487.53
Sweden (krona)	11.16	11.53	11.76	24.60	25.42	25.93
Switzerland (franc)	2.79	2.89	2.83	6.14	6.37	6.24
UK (pound)	1.12	1.14	1.06	2.46	2.51	2.33
US (dollar)	1.75	1.80	1.95	3.86	3.97	4.30

SWU VALUE AND UF_6 VALUE EXPRESSED IN SELECTED PRODUCER & CONSUMER CURRENCIES[1]

	SWU Value at 0.30% Tails Assay This Month (Nov 30, 1989)	SWU Value at 0.30% Tails Assay Last Month (Oct 31, 1989)	UF_6 Value per kg U as UF_6 This Month (Nov 30, 1989)	UF_6 Value per kg U asUF_6 Last Month (Oct 31, 1989)
Australia (dollar)	73.08	75.35	35.38	36.07
Belgium (comm. franc)	2,140	2,274	1,036	1,089
Canada (dollar)	66.46	69.24	32.18	33.15
EEC (ecu)	49.87	52.84	24.14	25.29
Finland (markka)	239.29	250.64	115.86	120.00
France (franc)	347.56	367.60	168.29	176.01
FRG (mark)	101.89	108.26	49.33	51.83
Italy (lira)	75,158	79,483	36,392	38,057
Japan (yen)	8,143	8,372	3,943	4,009
Netherlands (guilder)	114.92	122.20	55.64	58.51
South Africa (rand)	148.28	155.22	71.80	74.32
Spain (peseta)	6,565	6,892	3,179	3,300
Sweden (krona)	363.50	377.96	176.00	180.97
Switzerland (franc)	90.75	94.76	43.94	45.37
UK (pound)	36.41	37.31	17.63	17.86
US (dollar)	57.00	59.00	27.60	28.25

[1]Calculated using currency exchange rates published in the *Wall Street Journal* on the last working day of the month.

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CURRENT MARKET DATA

RECENT TRANSACTIONS[1]

URANIUM SALES

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds of U_3O_8 equivalent)	Approximate Price Range[2] as Percent of Current Exchange or UF_6 Value	Seller	Buyer	Remarks
4630	1989	50–100	See Remarks	R[3]	Producer	Transaction Occurred Earlier in 1989
4634	1989	601–1,000	See Remarks	Producer	R[3]	Transaction Occurred Earlier in 1989
4677	1989	101–300	See Remarks	Producer	Utility	Transaction Occurred Earlier in 1989
4686A	1989	Less than 50	See Remarks	Intermediary	Intermediary	Contained in LEU
4687	1990	50–100	103–107	Intermediary	Utility	
4688	1990	101–300	See Remarks	Producer	Intermediary	Transaction Occurred Earlier in 1989
4689	1989	101–300	98–102	Intermediary	Producer	
4690	1990	601–1,000	98-102	Intermediary	Producer	
4692	1989	101–300	98–102	Intermediary	Utility	
4693	1989	101–300	98–102	R[3]	Intermediary	UF_6
4696A	1990	601–1,000	See Remarks	Intermediary	Utility	Contained in LEU
4697	1990	101–300	98-102	Intermediary	Intermediary	UF_6

[1] Transactions listed are not limited to those in which NUEXCO was involved, but also include others of which NUEXCO is aware. NUEXCO may delay reporting some transactions in order to protect proprietary information.
[2] The range reflects five percentage points (inclusive) per grouping, centered about the middle of the range.
[3] The notation R means that NUEXCO either does not know, or that NUEXCO has restricted that information to protect client or source confidentiality.

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LOAN TRANSACTIONS[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds of U_3O_8 equivalent)	Approximate Price Range[2] as Percent of Current Loan Rate	Lender	Borrower	Remarks
4691	1990	601–1,000	R[3]	Utility	Intermediary	

CONVERSION SERVICES SPOT MARKET SALES[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity (thousand pounds of U equivalent)	Approximate Price Range[2] as Percent of Current C.V.	Seller	Buyer	Remarks
4645	1991–95	301–600	R[3]	Converter	Utility	
4685	1989–93	3,001–6,000	See Remarks	Converter	Utility	Transaction Occurred Earlier in 1989
4699	1990–91	601–1,000	R[3]	Intermediary	Utility	

ENRICHMENT SERVICES SECONDARY MARKET SALES[1]

NUEXCO Transaction Number	Delivery Period	Approximate Quantity[4] (thousand SWUs)	Approximate Price Range[2] as Percent of Current SWU Value[5]	Seller	Buyer	Remarks
4686B	1989	Less than 50	See Remarks	Intermediary	Intermediary	Contained in LEU
4694	1990	Less than 50	98-102	Intermediary	Utility	
4696B	1990	101–300	See Remarks	Intermediary	Utility	Contained in LEU

[1] Transactions listed are not limited to those in which NUEXCO was involved, but also include others of which NUEXCO is aware. NUEXCO may delay reporting some transactions in order to protect proprietary information.
[2] The range reflects five percentage points (inclusive) per grouping, centered about the middle of the range.
[3] The notation R means that NUEXCO either does not know, or that NUEXCO has restricted that information to protect client or source confidentiality.
[4] If tails assay is unknown or unspecified, NUEXCO's calculation of SWU quantity assumes 0.30 w/o tails assay.
[5] Prices are usually normalized to 0.30% tails assay. Refers to SWU Value that corresponds to SWUs included in transaction. When prices and SWU values are expressed as discounts from a reference price (e.g., X dollars less than DOE's USEC base price at time of delivery), the percentage price range is based on the discounted prices, not on the reference price.

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CURRENT MARKET DATA

URANIUM SUPPLY
(November 30, 1989)

NUEXCO Project Number	Delivery Period[1] (Thousand Pounds of U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale			
ACTIVE			
88-1026	150	—	1990
89-1001	1,300	1,000 per year	1990, UF_6
89-1128*	1,130	—	1990, U_3O_8/UF_6
89-1156	200	—	1990
89-1180	1,000	—	1990
89-1188*	150	—	1990
89-1194	100	—	1990
89-1201*	3,000	—	1990
89-5000A	1,280	—	1990, UF_6
Total	**8,310**		
INACTIVE			
88-1081	340	—	1990, UF_6
89-1029	1,200	300 per year	1990-98
89-1076*	500	250 per year	1990 on
89-1173	1,000	—	1990
89-1209*	400	—	1990-93
89-1239*	200	400 per year	1990, UF_6
87-1005	—	250 per year	1990-95
87-1109	—	350 per year	1990-on
87-1123	—	1,000 per year	1990-on
88-1157	—	1,000 per year	1990 on, UF_6
Total	**3,640**		

* New or revised since last month.
[1] Measured from the date of this Report.
[2] For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 88-1001, 89-1200.

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URANIUM DEMAND
(November 30, 1989)

NUEXCO Project Number	Delivery Period[1] (Thousand Pounds of U_3O_8) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Inquiries to Purchase:			
ACTIVE			
89-1175	170	170 per year	1990-91
89-1183	400	—	1990
89-1208	95	—	1990
89-1218	1,000	1,000 per year	1990-93
89-1230*	100	—	1990
89-1232*	270	—	1990
89-1138*	360	—	1990, UF_6
89-1241*	250	—	1990
88-1227	—	1,600	1990-95, U_3O_8/UF_6
89-1090	—	150 per year	1991-96
89-1172	—	500 per year	1992 on
89-1176	—	600 per year	1991-96
89-1192	—	1,200	1992-97
89-1233*	—	160	1991, UF_6
89-1236*	—	250	1991-94, U_3O_8/UF_6
89-1242*	—	100 per year	1992-93
Total	**2,645**		
INACTIVE			
89-1067	500	—	1990
89-1163	1,000	—	1990
89-1167	350	350 per year	1990-94
89-1187	325	—	1990, UF_6
89-1189	500	—	1990
89-1237*	—	150 per year	1990
Total	**2,675**		

* New or revised since last month.
[1] Measured from the date of this Report.
[2] For delivery within one year. This category excludes material deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 89-1068, 89-1133, 89-1142A, 89-1164, 89-1199, 89-1210, 89-1224.

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CURRENT MARKET DATA

LOAN SUPPLY AND DEMAND
(November 30, 1989)

NUEXCO Project Number	Delivery Period[1] (Thousand Pounds of U_3O_8) Within 1 Year	Beyond 1 Year	Remarks
Available for Loan:			
ACTIVE			
87-1167	460	—	UF_6
88-1182	4,000	—	U_3O_8/UF_6
89-1077	500	—	U_3O_8
89-1184	200	—	U_3O_8
89-1186	200	—	U_3O_8
89-1196	1,300	—	UF_6
89-1206	300	—	U_3O_8
89-1225	700	—	U_3O_8
Total	**7,660**		
INACTIVE			
None reported			
Available to Borrow:			
No inquiries to borrow are reported			

* New or revised since last month.
[1] Measured from the date of this Report.
Projects removed since last month: 89-1213.

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CONVERSION SUPPLY AND DEMAND
(November 30, 1989)

NUEXCO Project Number	Delivery Period[1] (Thousand Pounds of U as UF_6) Within 3 Years	Beyond 3 Years	Remarks
Available for Sale			
ACTIVE			
89-5000C*	1,080	—	
89-5001A*	440	—	
89-5002*	600	—	
Total	**2,120**		

Inquiries to Purchase

No inquiries to purchase conversion services are reported

* New or revised since last month.
[1] Measured from the date of this Report.
Projects removed since last month: 89-1212.

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CURRENT MARKET DATA

SWU SUPPLY AND DEMAND
(November 30, 1989)

NUEXCO Project Number	Delivery Period[1] (Thousand SWUs) Spot or Near-term[2]	Intermediate or Long-term	Remarks
Available for Sale			
ACTIVE			
88-1082	25	—	1990
88-1096	190	—	1990
88-1200	15	—	1990
88-1210	300	—	1990
89-5000B*	250	—	1990
89-5001B*	200	—	1990
Total	**980**		
INACTIVE			
87-1128	**360**	**—**	**1990**
Total	**360**		
Inquiries to Purchase			
ACTIVE			
88-1236	250	—	1990-94
89-1243*	150	—	1990
88-1061	—	500	1991-95
89-1203*	—	135	1991-92
Total	**400**		
INACTIVE			
89-1043	**50**	**—**	**1990**
89-1047	**—**	**600**	**1991-95**
Total	**50**		

* New or revised since last month.
[1] Measured from the date of this Report.
[2] For delivery within one year. This category excludes SWU deliverable within one year under other than spot or near-term contracts.
Projects removed since last month: 89-1142B, 89-1211, 89-1214.

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NAMIBIA

Namibian Elections

Having peacefully conducted its first national election November 7–11, Namibia has taken an important step towards gaining its independence from South Africa. As expected, the South-West African People's Organization (SWAPO) won 57 percent of the votes, although the party fell short of obtaining the two-thirds majority required to write its own constitution. Almost 97 percent of the electorate turned out to vote for one of the ten registered parties and political alliances.

Following the elections, United Nations Special Representative for Namibia Martii Ahtisaari announced, "I have told the Administrator-General that I am satisfied that the voting process has been free and fair in accordance with UN Resolution 435 and have agreed that the process of counting votes should go forward." On November 13, after almost 700,000 votes had been tabulated, the UN formally certified the elections.

The election was held to create a 72-member constituent assembly based proportionately on the share of votes received by each party. Working quickly, the assembly convened on November 21, and elected Hage Geingob, a moderate SWAPO leader, chairman, and established the "Principles for a Constitution for an Independent Namibia". These principles are the same as those established in a 1982 supplement to the UN Security Council Resolution 435 which called for the independence of Namibia, and are based on multi-party democracy. They call for executive, legislative and judicial branches to be governed by the Constitution, and provide for human rights and freedoms.

Namibia's constitution must be approved by a two-thirds majority of the constituent assembly, and thereafter ratified by the UN Security Council. It appears this will be completed as scheduled by April 1, 1990, at which time the US has said it will lift sanctions against Namibia if the country is independent. US sanctions could be lifted earlier through Congressional action. However, Sam Nujoma, the President of SWAPO, recently told the press that he was not prepared to call on the UN to lift economic sanctions against Namibia until it is formally declared independent.

NAMIBIAN ELECTION RESULTS
November 7-11, 1989

Party or Political Alliance	Percent of Vote	Assembly Seats Acquired
SWAPO	57.3	41
Democratic Turnhalle Alliance	28.6	21
United Democratic Front	5.6	4
Action Christian National	3.5	3
Federal Convention of Namibia	n/a	1
Namibian National Front	n/a	1
National Patriotic Front	n/a	1

During the past several years, Namibia's sole uranium mine, Rössing, has maintained its usual production levels to retain its skilled work force and continue its reputation as a reliable supplier. The new Namibian government will have a 51-percent voting share in Rössing. Although it will not own any of the company assets, it will have the majority voice in how the company is run. According to the Chairman of Rössing, Dr. Zed Ngavirue, the company payroll accounts for 11 percent of the salaries paid in Namibia's private sector, and the new national leaders will be looking to Rössing to help improve economic health and employment.

UNITED KINGDOM

Nuclear Power To Remain in Public Sector

On November 9, UK Energy Secretary John Wakeham announced the government's decision to exclude nuclear power from its electricity privatization program due to

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uncertainties about nuclear energy's costs. Wakeham also reported that, although construction would continue on Sizewell-B, three other planned PWRs would be deferred, and not reconsidered until after Sizewell-B is completed. Although the announcement to abandon the nuclear program came as little surprise to many, the decision was particularly painful, since British scientists pioneered the development of nuclear energy for peaceful uses in the 1950s.

A recent government study assessing nuclear costs at more than twice those of other electricity sources was the catalyst for the decision, as it publicized serious questions about nuclear power's ability to attract private investors. These fears were exacerbated by recent estimates on clean-up costs of the Magnox stations and AGRs which rose sharply, and a ten-percent hike in the estimated completion costs of Sizewell–B.

In order to minimize the financial risks associated with nuclear power plants, National Power, the larger of Central Electricity Generating Board's (CEGB) two successors which was to be responsible for the nuclear sector, sought financial guarantees. The government considered requiring the ten area electricity distribution companies to purchase a minimum amount of non-fossil electricity, and imposing a tax on nuclear electricity production. Recently government advisors estimated that this nuclear levy could equal one-fourth the average wholesale cost of power for the distribution companies. Because subsidization of the industry would run counter to privatization goals and deter private investment, and amid fears that such a high tax could spawn other, more competitive energy projects, the government elected to keep nuclear energy under its auspices.

John Collier, Chairman of the UK Atomic Energy Authority, will head the new government corporation. Collier noted that the government's cost study does not accurately reflect nuclear energy's costs because it was based on the rate of return required by private investors in the UK (eight percent for a guaranteed market, and 15 percent without guarantees), compared to the government's requirement of five percent. Collier believes that nuclear power will return as a major option for the UK after 1994, and he plans to promote its earliest possible revival.

As scheduled, National Power and PowerGen, CEGB's other successor, will manage all conventional power plants, while the as yet unnamed government corporation will control the fourteen operating commercial nuclear power plants and Sizewell-B when completed.

USA

ABB-Combustion Engineering Merger

Combustion Engineering (CE) has announced an agreement to merge with the giant Swedish-Swiss engineering group Asea Brown Boveri Ltd. (ABB). The November 13 announcement prompted CE to be the most actively traded stock on the New York Stock Exchange that day. Its value increased by more than $13 to $39, just below ABB's $40-per-share offering price.

The $1.6 billion merger was selected as the most effective method of developing joint opportunities, and followed earlier discussions between the two companies concerning possible cooperation in the field of power generation. ABB, formed last year by the merger of Asea (Sweden) and BBC Brown Boveri (Switzerland), is the world's largest power-equipment supplier with 1988 sales of almost $20 billion. US revenues last year for ABB and CE were about the same at $3.5 billion each.

The merger will improve ABB's presence in the US market, via CE's knowledgeable sales staff and customer contacts, and will provide CE with greater technological and financial resources. Plans are for CE to maintain its present management structure and headquarters in Stamford, Connecticut.

This action underscores ABB's commitment to continued worldwide growth. In June 1988, ABB and Westinghouse agreed to market nuclear services in Europe—an enterprise expected to generate annual revenues of $100 million. ABB also announced plans to acquire Westinghouse's remaining interest in a US-based power transmission and distribution joint venture and recently completed a public offer to purchase all outstanding interests (22%) in ABB's West German unit, Asea Brown Boveri AG. CE and ABB also have a strong presence in Eastern Europe and the Soviet Union, and CE and Finland's Neste Corp. signed a $2 billion agreement with the Soviet Union to construct and operate three petrochemical plants in western Siberia.

The impending CE-ABB merger adds to the growing competition for the $11.5 billion US nuclear services market. Only three months ago, Babcock & Wilcox and Framatome S.A. announced a joint venture aimed at capturing more US market share. ■

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WASHINGTON FOCUS

The first session of the 101st Congress ended at 4 a.m. on November 22, 1989. Before leaving, the Senate confirmed William Young as Assistant Secretary for Nuclear Energy at DOE and Forrest Remick as NRC Commissioner. In addition, the Senate passed the budget reconciliation bill authorizing the NRC to collect 45% of its budget for FY 1990 from utilities, which amounts to approximately $1 million per plant. The budget bill also contributes $4.6 billion to deficit reduction by allowing the Gramm-Rudman reductions to remain in effect through the first week of February. Although Congress passed the State Department authorization bill, which included nuclear export sanctions against China, on November 21 the President vetoed the bill. Congress will reconvene on January 23, 1990.

William Young Nomination

On November 3, the Senate Energy and Natural Resources Committee held a confirmation hearing on William Young's nomination as Assistant Secretary for Nuclear Energy. His four goals are to:

- reorganize the Office of Nuclear Energy emphasizing stricter line management and make safety a primary goal in the operations of DOE's reactors,
- promote nuclear power as an option in the domestic energy mix and promote advance reactor designs,
- support legislative efforts to restructure the Department's uranium enrichment program and resolve questions about the future of the AVLIS process, and
- support development of small nuclear power systems for future space and military missions.

AVLIS Update

On November 7, William Young responded to questions on AVLIS submitted by Senators J. Bennett Johnson (D-LA) and Wendell Ford (D-KY) at the November 3 Senate Energy and Natural Resources Committee hearing. Senator Ford was concerned that AVLIS could end up the GCEP of the 1990s, and said "I'm not convinced that there is an adequate and timely plan for AVLIS deployment." Young indicated the Administration's continued support for AVLIS development and stated that a decision on deployment would be made after a full-scale demonstration, planned for 1992.

Concerning DOE's progress on including industrial participants in the demonstration phase of the AVLIS program, Young responded that DOE plans to set up an outside review group of business and technical experts from the industry, implement an industrial access program, and competitively select an industrial firm for implementing the transition of AVLIS technology to production. Responsibilities of this company could include construction and operation of a production plant. The details of this plan will be sent to Congress with the FY 1991 budget request.

For the first time, DOE admitted that defense funding for the Special Isotopic Separation (SIS) program is directly linked to AVLIS R&D, and revealed that the programs have been jointly funded since 1979, sharing lasers, process development, and project management. Successful completion of AVLIS assumes joint funding from both DOE and DOD of $20 to $30 million through FY 1991. Should either program reduce or eliminate its contribution to the shared costs, the other would be forced to make up the difference or reduce its program activities, thereby slipping schedule.

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The Committee asked about the status of a management review and establishment of an industrial access program for AVLIS required by the Energy & Water Development Appropriations bill for FY 1990. DOE responded the plan is expected to be submitted to the Secretary by year end and will describe its management approach, the resources necessary to take AVLIS through the demonstration phase, outline the major milestones between demonstration and deployment, and recommend the approach to be taken with deployment. Joseph M. Farley, Vice President of Nuclear, Southern Company Services, is one of the utility members DOE asked to assist with the management review and AVLIS industrial access program. DOE has selected Argonne National Laboratory to assist with the site selection process and the EIS. It plans to pursue draft site criteria sometime in the spring of 1990.

DOE Power Costs

DOE has completed a preliminary analysis of the impact of acid rain legislation on the two utilities which supply power to the gas diffusion plants. If the Clear Air Act is passed, DOE estimates its power costs will increase from $55 per SWU to $70 per SWU in 1995, and its total costs to $90 per SWU. The detailed study of the legislation's potential impact should be completed by the end of 1989. DOE's final costs could be lower if the Administration's bill, once enacted, allows utilities to trade emissions and provides incentives to promote clean coal technology.

Enrichment Plant Licensing

Sen. J. Bennett Johnston (D-LA) attached an enrichment plant licensing amendment to a Minnesota Public Lands Bill (HR 2783) which was approved by the full Senate on November 20. The amendment, which the NRC has endorsed, would allow the NRC to license enrichment plants under 10 CFR Parts 40 and 70 rather than under Part 50. Initiated by Louisiana Energy Services (LES), this change allows LES to apply for licensing under the regulations for chemical processing facilities rather than for production (reactor) facilities, which NRC Chairman Carr has said is more appropriate. Harold Arnold, President of LES, indicated the request was made now to ensure predictability in the licensing process and save time and money in the long run. He also noted that potential investors in LES would view the move as increasing the likelihood of success for the venture and facilitate raising capital. The bill must go to conference committee because of amendments from the Senate to the original bill. A staffer from the House Interior Committee expressed some doubts about proceeding in the House with this licensing amendment on a non-related bill. While the licensing amendment is not controversial within the committee, the House may be reluctant to vote on it without a prior hearing. The House could consider it immediately after reconvening, or perhaps include it with more related legislation such as restructuring DOE's enrichment enterprise. However, it is clear that the House has committed to consider this issue early next year.

Enrichment Restructuring Legislation

In an attempt to start the enrichment restructuring bill moving in the House, DOE initiated discussions with Rep. Philip R. Sharp (D-IN), Chairman of the Energy and Power Subcommittee of the House Energy and Commerce Committee, to seek authorization for an independent financial review of the department's enrichment program. After the Committee submitted its input on the

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scope of the study, DOE began seeking consultants for the project. Included in the announcement was a "Program Background", which had not been discussed with the Committee. Rep. Sharp wrote to Deputy Secretary Henson, stating that the Program Background is "nothing more than a rewriting of history, and contains so many false statements, misrepresentations, and biases that I am doubtful that the study could prove to be of any value." He concluded, "I suspect the damage has already been done, and the study will now likely have limited credibility at best." Clearly, DOE has antagonized Rep. Sharp, and the likelihood of an enrichment restructuring bill moving in the House from this committee is now questionable.

Western Governors' Association Endorsement

At its December 1-3 meeting in Las Vegas, Nevada, the Western Governors' Association (WGA) passed a resolution unanimously supporting Congressional restructuring of DOE's uranium enrichment program, clean-up of mill tailings, and restoration of the uranium mining industry's viability. The WGA also instructed its staff to communicate the text of the resolution to the President, appropriate administrative agencies, and Congressional committees, and to work with the staff to facilitate passage of a bill. This effort by the WGA should create some interest in the House in restructuring uranium enrichment legislation. Seventeen states are members of the WGA.

Another resolution passed at this meeting supported legislative revision to the Mining Law of 1872 as it affects unpatented mining claims. The Mining Law of 1872 regulates all hard rock mineral mining and has never been amended substantially. Congress is currently considering changes to the law.

Uranium Industry Viability

Although the Department of Commerce recently determined that uranium imports are not a threat to national security, twenty-one Senators, including Senators Johnston, Ford, Wirth, McClure and Domenici, sent a letter on November 20 to President Bush which indicated that a viable domestic uranium industry is in the national interest and expressed concern about the rapid demise of the industry. "We urge that you ... commit the Administration to active support of legislation already passed by the Senate to assist the uranium industry and restructure the enrichment enterprise; and that you direct continuing efforts by the Administration to assure the survival a of domestic uranium industry."

Radionuclide Emissions Regulations

Although EPA announced the regulations governing radionuclide emissions by the court ordered deadline of October 31, the rules have not yet been published in the Federal Register. Copies of the rule and some of the supporting documents have been available in the EPA's public document room, but other critical material such as the computer codes COMPLY and COMPLY R, which are essential for determining whether a facility is in compliance, are not yet available to the public. It appears there are differences between parts of the final rule and the proposed rule, but the effect and extent of these differences are difficult to determine until the EPA explains its criteria and implementation. This lack of information on specific standards and their enforcement is the major complaint of the industry thus far. ■

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NUEXCO

RECENT DEVELOPMENTS

Nuclear Fuel Industry Developments

November	
3	**Louisiana Energy Services (LES)** announced that its enrichment plant would be located in Claiborne, Louisiana. Howard Arnold, President of LES said, "Our next step will be to continue further in-depth geological and technical studies and to complete the administrative details of the purchase.
6	**Ontario's** Energy Minister Lyn McLeod announced that **no decisions on new nuclear plants** would be made until the next election (1991 or 1992). This statement contradicted an announcement earlier this year in which the provincial government indicated a decision was likely in 1990.
7-11	**Namibia** held its first free **national elections** in which the South-West African People's Organization (SWAPO) won 57 percent of the vote. The elections determined how many seats each political party or alliance would hold in a constituent assembly. The assembly has already begun drafting a constitution. (See article on page 13.)
9	UK Energy Secretary John Wakeman announced the **exclusion of nuclear energy** from the UK's **electricity privatization program** due to fears that its high costs would deter private investors. In addition, the UK cancelled its plans to construct three PWRs similar to Sizewell-B. (See article on page 13.)
13	The **Atomic Safety & Licensing Board** found Seabrook's emergency plan "adequate and implementable" and recommended that the Nuclear Regulator Commission (NRC) issue a full-power operating license. The NRC must make a decision within 30 days.
13	It was announced that the Swedish-Swiss electrical supply giant **ABB Asea Brown Boveri Ltd.** would purchase **Combustion Engineering (CE)** for US$40 per share, or approximately $1.6 billion. The merger will enable ABB to improve its presence in the USA and will provide CE additional financial and technical backing. Sales of both companies in 1988 totalled approximately $7 billion in the USA. (See article on page 14.)
20	**Umetco Minerals** announced a **cutback** in its uranium and vanadium mining activities in Western Colorado as well as its Eastern Utah milling operations due to deteriorating market conditions. Umetco produced about 650 thousand pounds U_3O_8 in 1988, and is estimated to have about four million pounds stockpiled.
20	**Canada** and the **Soviet Union** agreed to cooperate in **nuclear technology development,** uranium exploration and development, and other peaceful uses of nuclear energy.
28	**DOE** announced a seven-year **delay** in the operation of a **permanent nuclear fuel waste repository** to 2010, provided the repository's linkage with an MRS is severed. DOE also plans to sue the State of Nevada, which has refused to allow testing at the proposed repository site.
28	**British Nuclear Fuels Ltd. (BNFL)** announced it would **establish a US subsidiary** to vie for clean-up work at DOE's nuclear sites and to offer assistance in nuclear plant decommissioning. BNFL believes it can compete successfully in the USA because no US firm offers the same experience or services.

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1989 Preliminary Market Review

Amid falling uranium prices and the liquidation of excess inventories, a buyers' market has influenced current contracting practices. More and more sales are occurring in the spot market, as buyers seek to take advantage of historically low prices. The duration of long-term contracts continues to shorten, and many contain some form of market related pricing. The effects of these trends are evident from NUEXCO's transaction data, some of which is summarized below. In this preliminary review of our 1989 market data, we concentrate on spot market activity, as well as several political developments that may affect the market in the longer term.

Uranium Spot Market Activity

With only a month remaining in 1989, sales volume in this year's uranium spot market has already reached a record high. Through November 30, spot market volume totalled over 20 million pounds U_3O_8 equivalent in 90 transactions. This is the highest level of sales since NUEXCO first began reporting transaction data in 1981. Last year NUEXCO reported 81 spot market sales involving a total of 14.6 million pounds, while in 1987 approximately 19.9 million pounds were sold in 85 sales.

The Exchange Value fell steadily throughout 1989, from $11.75 at December 31, 1988, to $9.20 eleven months later, a 22-percent drop in then-current dollars. The UF_6 Value also declined 22 percent, from $35.50 at December 31, 1988, to $27.75 at November 30, 1989. Aggressive sellers and the lack of firm demand accounted for much of the downward pressure on prices. Many buyers, sensing the possibility of continued price weakness, postponed purchasing until firm needs had to be met. Buying on the spot market for current demand has become an accepted practice with utility buyers. An increasing number of producers elected to purchase uranium to meet some of their supply commitments rather than produce, for at current spot price levels, few producers are able to cover their production costs. In fact, four US mines have announced shutdowns this year, in addition to the four South African mines which ceased uranium recovery operations in 1988.

In early 1989, two political and legal developments, though not unexpected, dealt twin blows to US uranium producers. The enactment on January 1 of the US/Canada Free Trade Agreement effectively gave Canadian uranium domestic status in the USA. This agreement also made moot the four-year-old US Producers' lawsuit against DOE, and on January 27, the Plaintiff ended legal proceedings. Together, these events essentially eliminated any near-term prospect of a significant premium for US-origin uranium. US producers and other holders of excess US-origin material then began to sell off stocks that had been acquired in anticipation of favorable judicial or legislative actions. Legislation identical to that proposed in 1988 again was introduced into Congress, but without success. Those hoping for legislative assistance soon joined other sellers of US-origin inventory.

Throughout the year, many market participants wondered where the seemingly unending supply was coming from. The liquidation of excess inventories provided much of the material, as did numerous loans which served to reposition existing stockpiles. Such transactions created the appearance of substantially larger supplies.

Chinese and Soviet suppliers offering competitive material also contributed to the oversupply. During the first half of the year, Chinese Nuclear Energy Industry Corporation (CNEIC) aggressively sought to expand its market share. However, as prices dropped below $11, it appeared to withdraw, indicating a reluctance to participate at lower price levels. Uranium from the Soviet Union also came into the market via sales of enriched uranium product, primarily in Europe. To offer potential customers more assurance about reliability of supply, both Chinese and Soviet suppliers stockpiled material in the USA during the year.

The liquidation of the West German uranium stockpile by the Federal Ministry of Research & Technology (BMFT), a long-standing concern of DOE and uranium producers, began in 1989. The government sold approximately 2.7 million pounds U_3O_8 equivalent of its "offset" material, which was originally purchased in the 1970s to help offset the costs of maintaining US troops on West German soil. Concerns that such a large quantity of material would flood

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the market appeared to trigger a further round of price declines. Then, after the transaction's psychological impact had been absorbed, actual sales of the BMFT material, at extremely aggressive prices, exerted additional downward pressure on the market.

Developments Affecting the Long-Term Market

Two significant developments in 1989 will have long-term implications for the market:

- changes in the Australian government's floor price policy;
- the impending removal of sanctions against Namibian uranium.

Although the Australian government announced plans to review its three-mine and floor price policies in 1989, no formal revisions can be expected until mid-1990. However, by approving the renewal of long-term contracts this year at $26 per pound U_3O_8—$5 less than the official floor price—it effected a *de facto* floor price change. In addition, Primary Industries and Energy Minister John Kerin stated that the floor price in *new contracts* would be determined at a level which reflected the national interest in particular circumstances and the market conditions in which the contracts are negotiated. No doubt, the difficulties ERA had with its contract renegotiations in 1989 were, in some measure, responsible for these actions. As a result of this change, Australia's presence in the long-term market can be expected to increase.

The possibility of lifting *de facto* and *de jure* sanctions against Namibian uranium also attracted much attention in 1989. An agreement signed early in 1989 among South Africa, Angola, and Cuba initiated the Namibian independence process. Following Namibia's November election of its first constituent assembly, the United Nations declared the elections free and fair. As a result, anti-apartheid sanctions against Namibia will likely be removed in early 1990. This will enable Namibia's Rössing mine, a major contributor to the country's GNP, to compete freely on the world market. Although the potential change in Namibia's political status did not directly affect the uranium market in 1989, the availability of Namibian-origin material could increase competition next year for those opportunities involving purchasers who were previously barred from buying Namibian uranium.

Loans

Loan material was readily available during the year, and NUEXCO's preliminary estimate indicates that 16 natural uranium loans involving 8.3 million pounds U_3O_8 equivalent took place through November 30. All types of market participants, both US and European, loaned or borrowed material. Lenders were typically utilities, while traders and producers borrowed the bulk of material. Loans resulted in the existing stockpiles being repositioned, augmenting the ample supplies of uranium available from other sources. The Loan Rate remained at 3.5 percent per annum throughout the year.

Conversion

The conversion market remained stable over most of 1989, although increased competition among the primary converters in the spot market as well as large supplies of UF_6 arising from the partial liquidation of the West German government uranium stockpile and other sources, placed growing pressure on spot prices towards year-end. As primary converters became more active in the secondary market, the distinction between primary and secondary markets blurred. The Conversion Value declined from $1.95 at December 31, 1988 to $1.75 at November 30, 1989. NUEXCO has reported 14 conversion transactions during the first eleven months of 1989, involving almost 6.2 million pounds U as UF_6.

Enrichment

The SWU price dropped by approximately twelve percent during 1989 in then-current dollars, from $65 at December 31, 1988, to $57 at the end of November. Utilities purchasing spot market SWU fostered very aggressive competition among suppliers. Multiple bidders, low prices, and extremely favorable terms characterized most of the SWU sales in 1989. The West German stockpile material, which was sold at progressively lower prices, had an important role in most SWU sales that occurred later in the year. NUEXCO reports seven enrichment transactions through November 1989, involving a total of more than one million SWU. ■

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VOLATILITY OF MINERAL PRICES

In recent years, the term "volatile" has been linked more and more frequently to uranium prices. Certainly, uranium prices have changed substantially over the past decade, and in recent months the spot market price has dipped to record lows. The question arises, however, as to whether or not such changes are unusual in terms of natural resources, or whether other mineral commodities also exhibit significant price changes.

NUEXCO maintains ongoing price files for many natural resources. This data provides some perspective for comparing price changes in uranium with those in other minerals. In order to develop a basis for comparison, the study period has been limited to post-World War II, and prices as well as price changes have been calculated in constant 1988 US dollars. All prices relate to US deliveries and sales.

Table 1 summarizes certain of the price characteristics of various natural resource commodities. Average annual constant-dollar prices as well as the magnitudes of annual price variations are illustrated graphically on the following pages. Both the table and the graphs seem to indicate that uranium prices do not exhibit unusual volatility. Indeed, most of these commodities seem to have suffered through several periods of rapid price change.

TABLE 1
PRICE CHARACTERISTICS OF
NATURAL RESOURCE COMMODITIES (1948-1988)

Commodity	Average Constant Dollar Price[1]	Current Price[2]	Standard Deviation of Annual Prices	Standard Deviation (Percent)[3]	Maximum Annual Price Volatility	Averge Annual Price Volatility
Aluminum (lb)	0.77	0.83	0.10	13%	46%	7.4%
Coal (ton)	21.37	22.00[4]	6.48	30%	55%	5.5%
Copper (lb)	1.09	1.39	0.24	22%	41%	10.7%
Gold (troy oz)[5]	319.40	360.30	151.10	47%	71%	22.5%
Lead (lb)	0.44	0.41	0.11	25%	39%	13.8%
Mercury (flask)	697.16	262.50	427.89	61%	132%	20.2%
Molybdenum (lb)	4.88	3.43	2.15	44%	97%	10.2%
Petroleum (bbl)	13.42	16.40[6]	6.62	49%	50%	9.2%
Silver (troy oz)	6.05	5.11	4.07	67%	82%	16.0%
Tin (lb)	5.19	3.98	1.95	38%	46%	11.1%
Uranium (lb)	31.70	9.40	14.24	45%	97%	13.6%
Vanadium (lb)	7.85	4.95	1.32	17%	73%	11.1%
Zinc (lb)	0.48	0.84	0.09	19%	46%	10.8%

[1] 1988 US dollars
[2] August 1989
[3] Percent of average constant dollars prices
[4] Preliminary 1988 average
[5] All gold price characteristics are based on the period 1968-1988 in which gold prices have been decontrolled.
[6] June 1989

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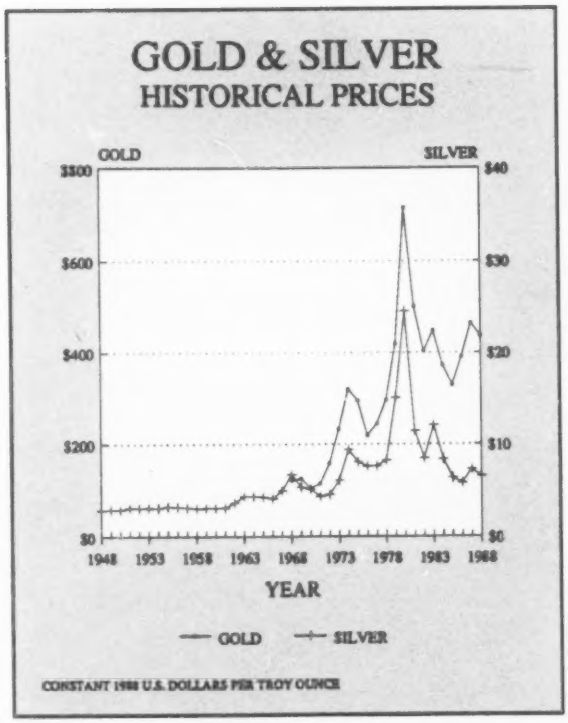
Precious Metals

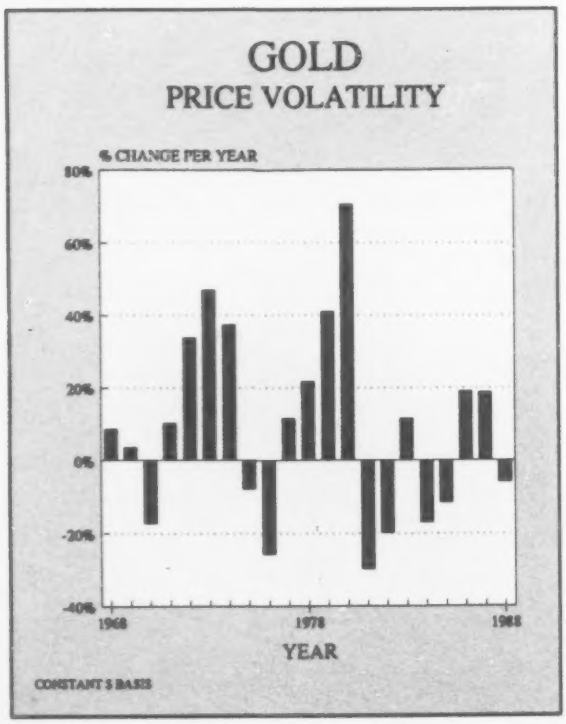
In recent years, gold and silver prices have been characterized by substantial volatility. Speculation, interest rates, oil prices, inflation, and international tensions all seem to have had their impact.

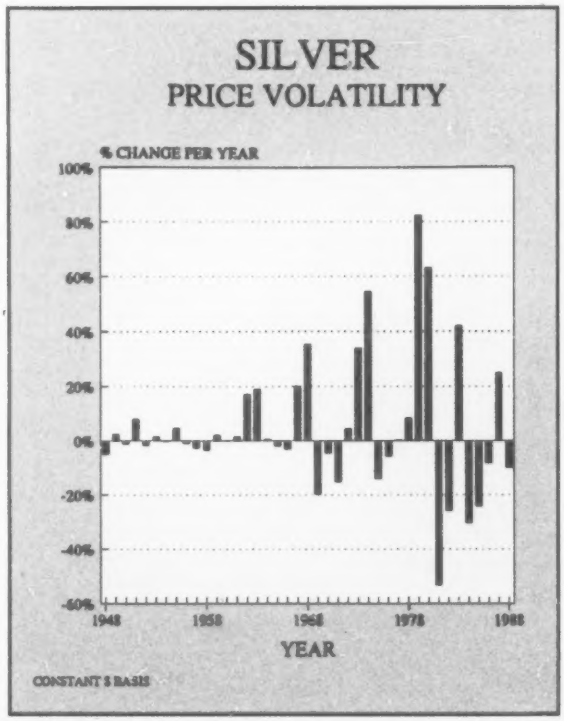
Record high silver prices occurred in 1980 in response to the Hunt Brothers' attempt to corner the silver market. However, volatile silver prices are not just a recent phenomenon. The silver boom and bust years of the late 1800s were replete with many sagas of the rise and fall of the silver barons, including Colorado's Horace Tabor and his celebrated bride Baby Doe.

From 1792 to 1968, the US Government supported stable gold prices through a stockpiling program of the US Treasury. Since 1968, however, gold prices have been allowed to seek market levels. Gold prices also hit record highs in 1980 as the speculative fever for silver carried over into other precious metals. High gold prices have encouraged a rapid increase in gold production (more than 50 percent since 1982). It will be interesting to follow near-term gold prices to see how they are affected by this increased production.

PRECIOUS METALS







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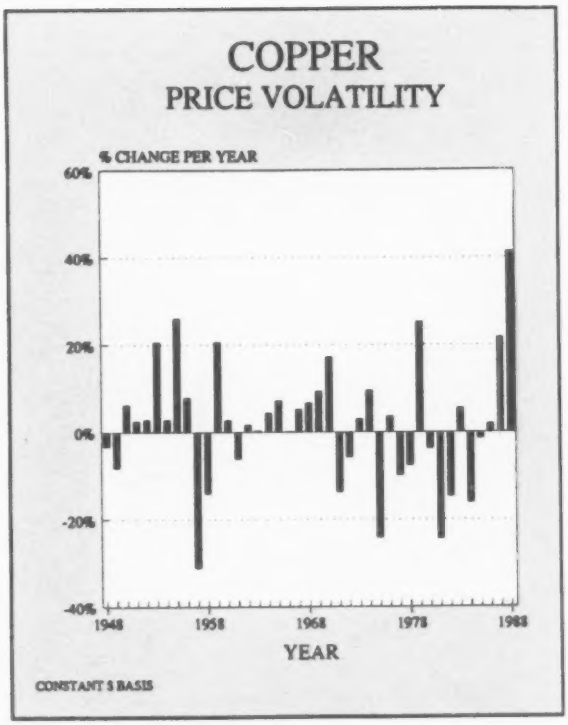
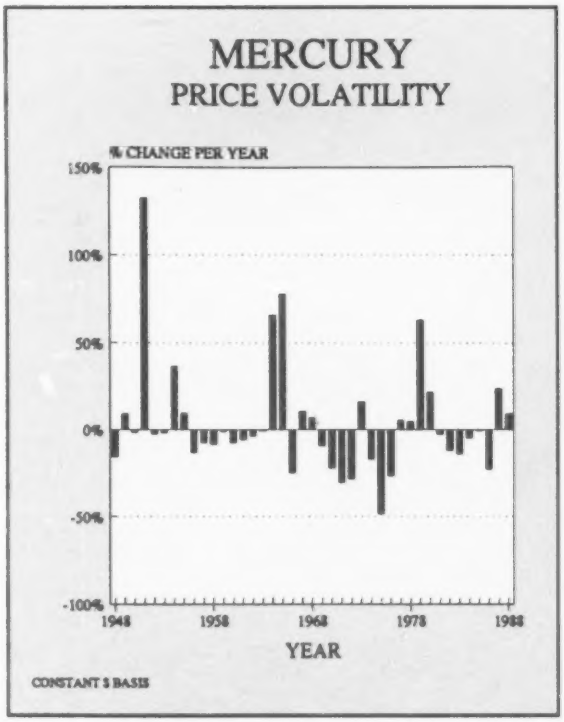
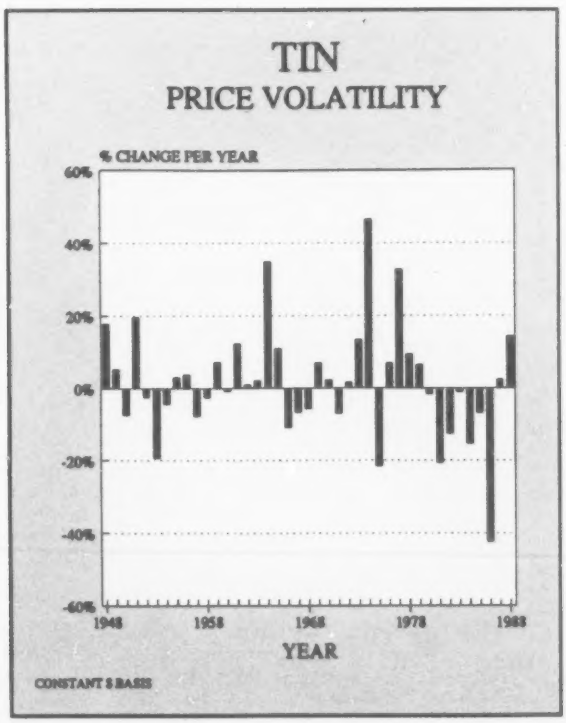
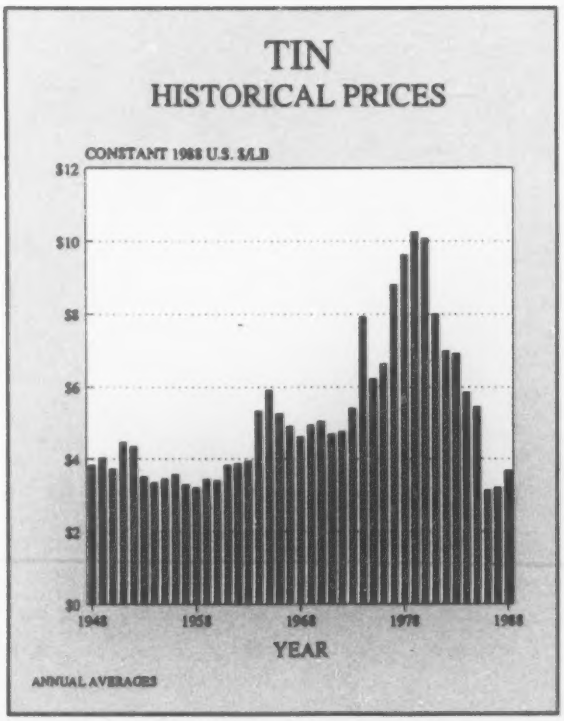
BASE METALS









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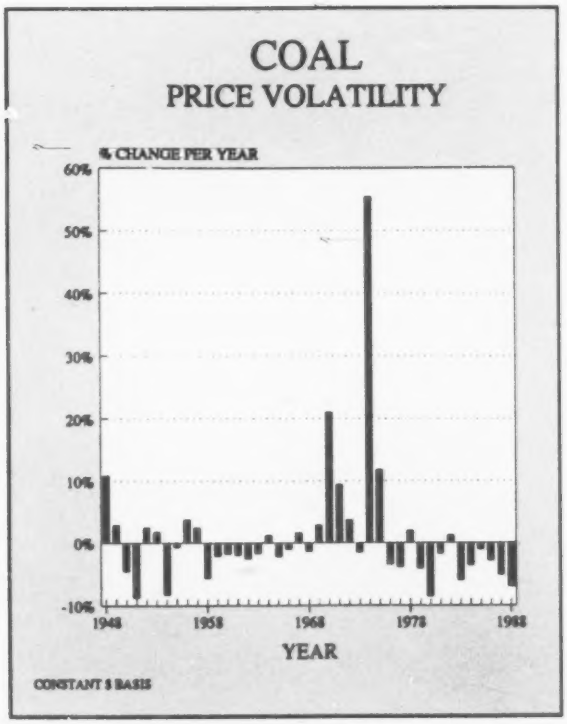
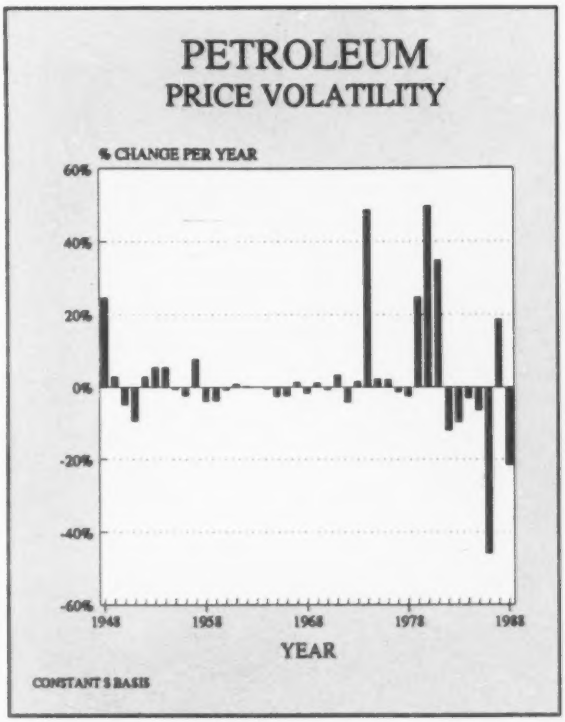
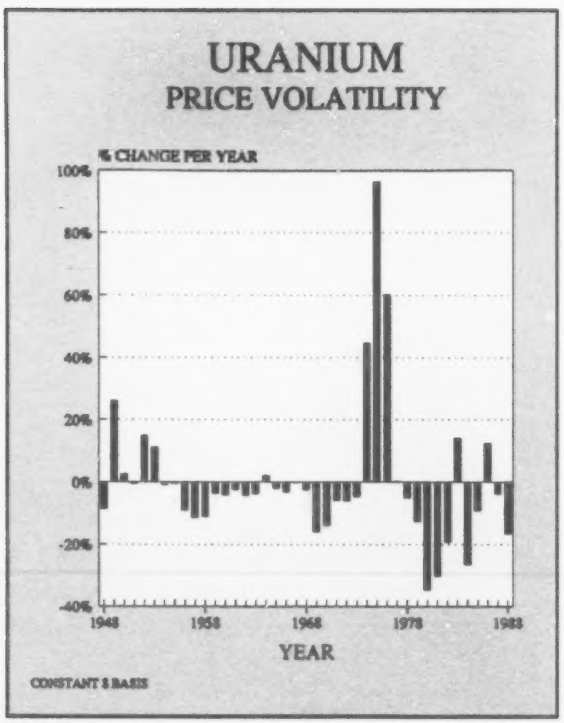
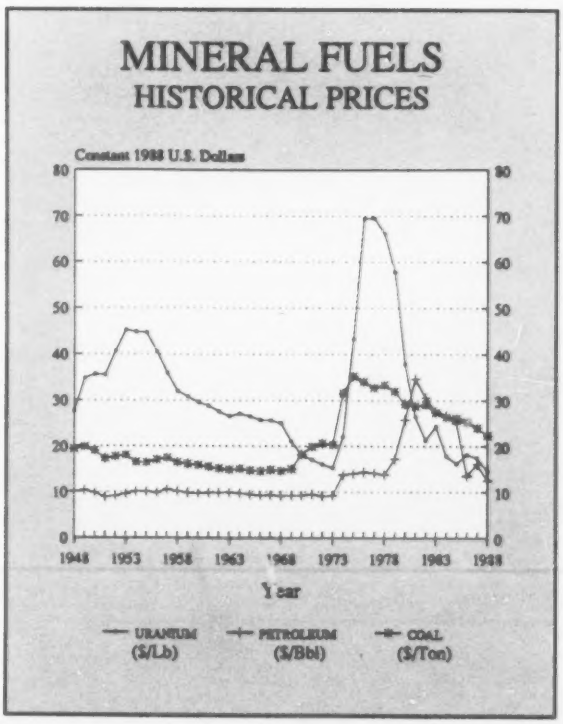
MINERAL FUELS









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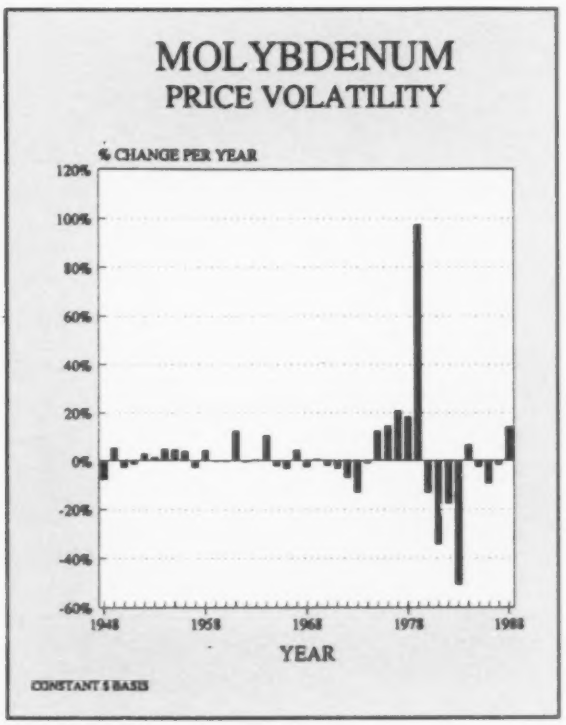
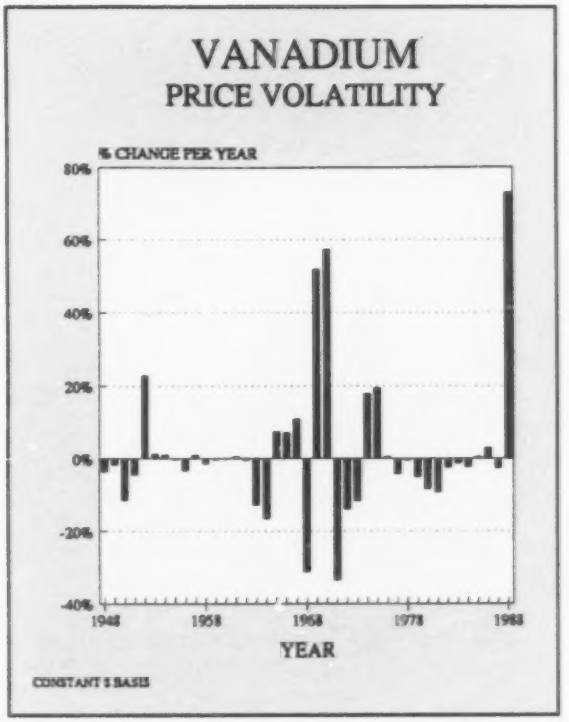
SPECIALTY METALS





Base Metals

Base metals such as aluminum, copper, lead, mercury, tin, and zinc have all experienced rapid changes in price during the past four decades. Prices for most of these commodities were notably low in the mid-1980s, but substantial recoveries have been made in the last two years.

Lead and mercury prices have suffered substantially from health-related concerns and have limited demand.

Tin prices provide an interesting story of the rise and fall of a "controlled" market. The International Tin Council (ITC) was formed among producing and consuming nations in 1956 to stabilize prices through controlled production and stockpiling activities. These efforts rewarded the producers with increasing real prices through the early 1980s. High prices, however, caused decreased demand, and the tin market collapsed in 1986.

Mineral Fuels

NUEXCO's readership needs little explanation of the price trends for mineral fuels or the reason for those trends. It is interesting to note, however, the similarities between coal, petroleum and uranium price movements.

Specialty Metals

Specialty metals such as molybdenum and vanadium tend to have narrow markets which are highly dependent upon a specific industry such as steel. In addition, production may be concentrated among only a few producers. This concentration has tended to provide for relatively stable prices through the years.

Molybdenum prices, for example, were exceptionally stable through the mid-1970s as the Climax Molybdenum Co. completely dominated world production. Increasing competition in the late 1970s seems, however, to have destabilized prices.

Tom C. Pool
NUEXCO Information Services

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RAW MATERIALS

RESTRUCTURING OF THE URANIUM PRODUCTION INDUSTRY

Introduction

The restructuring of the uranium production industry began in response to persistently low spot market prices and continues due to expectations that market conditions will remain depressed in the foreseeable future. This situation has affected even those producers who neither participate in the spot market nor incorporate spot market prices into their long-term uranium sales agreements, because long-term market prices have declined as well.

Utility consumers of uranium are focusing less on the issue of supply reliability and increasingly upon the direct cost of the product, a trend that began in the USA and has extended in recent years throughout the world. As prices have collapsed, utilities worldwide are giving more serious consideration to the spot market and are purchasing material for near-term delivery and, to varying degrees, using spot market price references in their multi-year supply agreements.

The much-publicized Japanese utility-US producer long-term uranium supply agreements executed in the past two years generally take into account the spot market price in determining the contractual delivery price. This is clearly a departure from the pricing provisions in uranium supply agreements entered into by Japanese utilities in the 1970s and early 1980s.

How are uranium producers responding to these changing conditions? This article focuses on the current production situation by country and the factors that may prove important in determining future capacity and output.

Australia

In 1989, industry attention focused on the *de facto* revision of the official US$31 per pound U_3O_8 Australian floor price. On September 4, Primary Industries and Energy Minister, John Kerin, announced governmental approval of Energy Resources of Australia's (ERA) negotiated agreements with its equity shareholder/customers. What was surprising, however, was that the Hawke government approved prices at $US26.00 per pound U_3O_8. Of greatest importance was Kerin's statement that, "When considering new contracts concluded by Australian producers, the floor will be determined at a level which reflected the national interest in particular circumstances and market conditions in which the contracts are negotiated." The Minister added, "I will need to be satisfied that prices producers have concluded are, at least, comparable with those being received by others in the market."

The "three mine policy", which currently allows uranium exports via letters of determination from only three mines—Ranger (ERA), Olympic Dam (Western Mining/BP Minerals), and Nabarlek (Queensland Mines), continues as the major unresolved political matter. However, ERA has announced that its planned expansion program has been deferred due to market conditions. However, Australian uranium production appears to be proceeding at a relatively stable rate as the start-up of Olympic Dam offsets the exhaustion of Nabarlek's original reserves.

Canada

The US-Canada Free Trade Agreement has substantially reduced the differences between uranium concentrates of Canadian and US origin. The term "North American origin" has come into common use throughout the nuclear fuel market.

Clearly, uranium market conditions are exerting a strong influence on decision-making within the Canadian uranium production industry. Early this year, Cameco announced that Rabbit Lake operations would be shut down on July 1 for at least six months. The company specifically cited market conditions as the primary decision factor. Later, Cameco announced the shutdown of Cluff Lake operations for at least six months, once again citing depressed market conditions. Key Lake continues to operate at or near capacity.

There is widespread uncertainty involving several announced new uranium properties in Western Canada (Northwest Territories/Saskatchewan) including Cigar Lake, Midwest Joint Venture, Dawn Lake, McClean Lake, and Kiggavik. The inability to secure long-term uranium sales agreements which provide for acceptable market risk

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to the producer and allow for project financing will definitely hinder the development of these projects.

The Elliot Lake operations of Denison Mines Ltd. and Rio Algom Ltd. continue to respond to market conditions through improved efficiency and cost-cutting programs. Moreover, these producers entered into long-term uranium supply agreements during the mid-to-late 1970s which have provided for relatively stable pricing and profitability. Once again, the future of these operations will become an increasingly important issue as some of these agreements expire or become eligible for cancellation in the early 1990s.

Namibia

The recent free elections held in Namibia represent a milestone for that country as well as the future of the Rössing mine. The South-West African People's Organization (SWAPO) attained a 57-percent majority, but failed to garner the necessary two-thirds majority to allow that group to develop its own constitution. Consequently, a multi-party government will likely determine the future course of Namibia.

Rössing, one of the world's largest uranium producers, has continued to operate at a high capacity level in spite of the increasingly restrictive trade sanctions against materials from South Africa and Namibia. With the advent of Namibian independence, government sanctions related to apartheid should be lifted by early 1990. This will allow Rössing origin material to enter the marketplace on an equal footing with its competitors. In fact, some countries may even exhibit a preference for Namibian material as a demonstration of support for the new government.

South Africa

Uranium production from the gold mines of South Africa has fallen precipitously over the past several years. As economic sanctions have taken effect and market prices declined, the NUFCOR producers have reacted by shutting in uranium production and, in some cases, converting uranium recovery facilities to gold recovery.

Uranium concentrates production fell from almost 15 million pounds U_3O_8 as recently as 1984, to less than ten million pounds U_3O_8 in 1988. Production through the first nine months of 1989 approximated 5.5 million pounds U_3O_8, suggesting that total production for 1989 should fall in the range of 7 to 7.5 million pounds U_3O_8. Additional reductions might take place in the near-term as the South African producers struggle with the current political and economic uncertainties.

France and Central Africa

The close ties between Cogema, the French government, and the former French colonies of Niger and Gabon have served to provide some degree of insulation between French uranium interests and market forces. That insulation is under increasing pressure, however, as world prices drop further below French production costs.

In late 1988, Cogema announced a staff reduction at its domestic uranium production operations. This was the first such reduction in its history. Gabonese production is running at about 50 percent of capacity, and operations in Niger have recently been shifted to economically more favorable deposits.

China and the Soviet Union

The recent entry of China and the USSR into the world nuclear fuel market puts increasing pressure on western producers, as both countries have substantial uranium production capabilities. Much of China's past production has been dedicated to military use, but recent announcements indicate that the future focus will be on nuclear fuel. The USSR has produced large quantities of uranium for both military and civilian use. A recent decrease in the rate of expansion of its nuclear program, however, has not yet been reflected in reduced uranium production either domestically or in the other Warsaw Pact countries. Thus, both China and the USSR have production surpluses which are beginning to enter the world market, and which will, at least in the near term, contribute to an already oversupplied market.

United States

According to the Energy Information Administration (EIA), the deterioration of the US uranium production industry has abated over the past couple of years. Annual production levels exhibited some stability in the 12-13 million pound per year range, while industry employment actually increased slightly in 1988. New production facilities were developed (Highland Uranium Project, Kingsville Dome, Rhode Ranch) and producers reported economic reserves of more than 300 million pounds U_3O_8.

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RECENT PRODUCTION SUSPENSIONS

1988	1989
Harmony—South Africa	Mt. Taylor (Chevron)—USA
Stilfontein—South Africa	Sunshine Bridge (Freeport)—USA
Driefontein—South Africa	Grants, New Mexico (Homestake)—USA
Randfontein—South Africa	Kingsville Dome (URI)—USA
Lucky Mc (Pathfinder)—USA	Rabbit Lake (Cameco)—Canada
Lisbon (Rio Algom)—USA	Cluff Lake (AMOK)—Canada

The Secretary of Energy has found the industry to be "non-viable" for four consecutive years (1984-1987).

In September 1989, the US Department of Commerce found that uranium imports did not present a threat to national security and, in fact, the US-Japanese uranium sales agreements suggested an industry able to compete in the international marketplace. Nevertheless, additional production center closures have dominated the US industry since mid-year.

Uranium Resources, Inc. (URI) announced that Kingsville Dome would be shut down indefinitely because it was more economically advantageous to purchase necessary concentrates on the spot market than to produce. Chevron Resources made the decision to shut down Mr. Taylor in the event that an equity partner or buyer could not be located by the end of this year. Freeport Uranium Recovery Corporation (FURC) shut down the primary recovery circuit located at the Sunshine Bridge (Donaldsonville), Louisiana plant in response to continuing depressed spot market prices. Homestake Mining will no longer produce at its New Mexico mines and plans to shut the Grants Mill in response to the Mt Taylor closure. Those four shutdowns (assuming Mt. Taylor is closed) may account for an annual loss of production totalling more than 3.5 million pounds U_3O_8.

What is significant about all of these announcements is that these decisions affect uranium production facilities which have production costs at or below $20/pound U_3O_8. No longer does one see the closure of high-cost production facilities. Those facilities (especially in the USA) have already been closed and, in some cases, dismantled. Now the nuclear industry is witnessing the shutdown of the "cheap" production sources. No longer is viability the goal, *survival* has become the overriding concern.

The ability of US industry to survive is somewhat unchanged by the wide range of production facilities currently in operation: solution mining (in-situ leaching) and by-product operations in addition to conventional open pit and underground mines.

In order to overcome historically depressed prices and the emergence of aggressive foreign competition, a segment of the US uranium production industry opted to pursue the commercialization of solution mining technology. Companies such as Atlantic Richfield, US Steel, Everest Minerals, Uranium Resources, Mobil, Wyoming Minerals, Intercontinental Energy Corporation, UNC/Teton, Tenneco Minerals, Sequoyah Fuels and Uranerz, USA spearheaded the drive into this newly-emerging technology.

Solution mining is playing an increasingly important role in the USA. During 1988, uranium produced from solution mining technology accounted for almost 19 percent of the US total. The reactivation of the Irigaray Project (Malapai Resources) coupled with the commercial start-up of the Highland Uranium Project (Everest Minerals/Interuran)

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and the Kingsville Dome Project (Uranium Resources, Inc.) accounted for almost 1.9 million pounds of total US production. Production costs for the most efficient solution mining projects are generally less than $15.00 per pound U_3O_8. Based upon the current outlook for uranium market conditions, production facilities based upon in-situ leaching technology are likely to play an even greater role in the future.

By-product recovery from phosphoric acid, another non-conventional uranium production technology, has proven to be commercially viable. International Minerals & Chemicals (now IMC Fertilizer) and FURC secured long-term sales agreements and constructed their uranium recovery circuits at their phosphoric acid plants in the late 1970s and early 1980s. Production steadily increased and reached approximately 3.3 million pounds U_3O_8 during 1988. The annual production stream from the two phosphoric acid by-product producers has remained relatively stable over the past several years. FURC's announced shutdown of the Donaldsonville facility will have only a minimal impact on 1989 production levels, which should exceed three million pounds U_3O_8. However, phosphoric acid by-product production will likely fall below that level in 1990.

Uranium production from conventional sources does play an important role in the USA. The Rhode Ranch project entered commercial operation in 1988 and has proven to be a cost-competitive production center. Unfortunately, the ore reserves have a limited life and will be mined out by 1992-1993. Development of the breccia pipes in Northern Arizona has been reduced in response to spot market prices, but production is being sustained. However, it is likely that production will decline as some of the operating mines reach the end of their economic life.

All in all, US production will likely decrease in the near future as producers shut down mines and purchase necessary concentrates in the open market. There is scant incentive to produce material when the option of purchasing the pounds remains economically attractive

Conclusion

The Western world's uranium production industry is under severe stress. Virtually all uranium producers are feeling the effects of chronically depressed market prices, and the concept of "viability" has been replaced by "survivability" for a number of producers. Historically low market prices (in real terms), which have persisted for the past several years, have had and will continue to have an impact not only on existing operations, but also on the development of new production centers, particularly in North America.

There appears to be no easy answer to the situation. As long as utility buyers desire to directly link prices under multi-year supply agreements with the spot market price, and potential suppliers respond to those customer requirements, then the industry will not recover until spot market conditions improve. Only time will tell whether this condition is healthy for the industry as a whole, or if it will lead to future market volatility due to uncertain uranium production.

Dustin J. Garrow
NUEXCO Trading Corporation

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HISTORICAL MARKET DATA

HISTORICAL EXCHANGE VALUES

Determined as of the last day of the month indicated ($US/lb U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1968	—	—	—	—	—	—	—	6.35	6.35	6.40	6.45	6.50
1969	—	6.35	6.10	6.10	6.25	6.25	6.20	6.20	6.15	6.15	6.15	6.20
1970	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.20	6.15	6.15	6.15	6.15
1971	6.20	6.20	6.20	6.20	6.15	6.05	6.00	5.95	5.95	5.95	5.95	5.95
1972	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95	5.95
1973	5.95	6.00	6.10	6.20	6.45	6.50	6.50	6.50	6.50	6.50	6.75	7.00
1974	7.70	7.90	8.00	9.00	9.50	10.50	11.50	12.00	12.50	14.00	14.75	15.00
1975	16.00	16.00	18.00	20.00	21.00	23.00	24.70	26.00	26.00	28.50	30.00	35.00
1976	35.20	37.00	39.25	40.00	40.00	40.00	40.00	40.40	41.00	41.00	41.50	41.00
1977	41.35	41.50	41.60	41.60	42.00	42.25	42.25	42.25	42.40	42.75	43.20	43.20
1978	42.90	43.25	43.25	43.25	43.40	43.40	43.40	43.10	43.25	43.00	43.25	43.25
1979	43.25	43.25	43.25	43.25	43.25	43.00	42.70	42.70	42.20	42.20	41.00	40.75
1980	40.00	38.00	35.00	32.00	32.00	31.50	31.50	30.00	28.50	28.00	28.00	27.00
1981	25.00	25.00	25.00	25.00	25.00	24.25	23.50	23.50	23.50	23.50	23.50	23.50
1982	23.00	23.00	22.50	20.75	20.50	19.25	18.25	17.00	17.00	17.50	19.75	20.25
1983	21.50	21.75	22.25	23.25	23.50	23.50	24.00	24.00	24.00	23.50	22.50	22.00
1984	20.50	17.50	17.00	17.75	17.75	17.50	17.50	17.50	17.50	16.00	15.50	15.25
1985	15.00	15.00	15.00	14.25	15.00	15.00	15.75	16.00	16.00	16.50	16.75	17.00
1986	17.00	17.00	17.25	17.25	17.00	17.00	17.00	17.00	17.00	17.00	16.75	16.75
1987	16.65	16.75	17.00	17.00	17.00	16.90	16.75	16.65	16.65	16.75	16.65	16.55
1988	16.30	16.15	15.90	15.75	15.40	15.10	14.75	14.15	13.75	13.15	12.50	11.75
1989	11.60	11.20	10.70	10.10	9.85	9.80	9.80	9.70	9.60	9.40	**9.20**	

HISTORICAL US PREMIUM (Relative to the Exchange Value)

Determined as of the last day of the month indicated ($US/lb U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	0.65	0.75
1987	0.85	1.00	1.50	1.50	0.90	0.60	2.50	2.35	2.10	1.65	0.85	0.65
1988	0.70	0.50	0.15	0.25	0.60	0.00	0.00	0.00	0.00	0.00	**None**	

HISTORICAL UF_6 VALUES

Determined as of the last day of the month indicated ($US/kg U as UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1985	—	—	—	40.50	42.50	42.50	44.00	44.50	44.50	46.00	46.00	47.00
1986	47.00	48.00	48.00	48.50	48.25	48.25	48.25	48.00	48.00	48.00	48.00	47.75
1987	47.75	48.00	48.00	48.00	47.75	47.75	47.50	47.00	46.75	47.00	47.00	47.00
1988	46.50	46.00	45.50	45.25	44.75	44.00	42.75	41.00	40.75	39.00	37.50	35.50
1989	34.75	34.00	33.00	30.50	30.25	30.25	30.00	29.75	29.75	28.25	**27.75**	

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HISTORICAL US UF_6 PREMIUM (Relative to the UF_6 Value)

Determined as of the last day of the month indicated ($US/kg U as UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	—	—	—	—	—	—	—	—	—	—	2.50	2.50
1987	2.50	2.50	3.50	3.00	2.25	1.75	6.50	6.00	4.25	3.10	2.25	2.00
1988	1.25	1.25	0.50	0.50	1.00	0.00	0.00	0.00	0.00	0.00	**None**	

HISTORICAL TRANSACTION VALUES

Determined as of the last day of the month indicated ($US/lb U_3O_8)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	—	—	—	—	39.60	39.70	39.70	40.40	40.30	40.60	40.70	40.70
1977	41.30	41.30	41.40	41.50	42.80	42.90	43.00	42.60	42.50	42.80	42.90	42.90
1978	43.10	43.30	43.70	43.60	43.60	43.20	43.30	43.40	43.40	43.60	43.40	43.70
1979	43.60	43.80	43.70	43.40	43.60	43.70	43.70	43.60	43.60	43.60	43.50	42.30
1980	42.00	39.30	38.60	38.40	37.90	37.60	37.30	31.60	30.60	29.00	28.70	27.70
1981	27.20	27.20	27.00	25.70	25.70	24.50	24.40	24.30	23.90	24.10	24.10	24.00
1982	24.00	23.70	23.40	22.60	22.70	21.50	20.30	19.10	17.30	17.00	17.55	18.80
1983	19.35	20.00	21.35	21.40	22.35	22.45	23.50	23.60	23.65	23.65	23.85	23.85
1984	23.05	22.50	19.25	17.90	17.00	16.50	16.60	16.40	16.55	16.05	15.90	15.90
1985	16.20	15.70	15.05	14.90	14.45	14.60	14.75	15.10	15.10	15.75	15.80	16.55
1986	16.55	16.70	16.70	17.10	17.15	17.20	17.50	17.45	17.35	17.25	17.30	17.35
1987	17.35	16.90	16.95	17.00	17.20	17.10	17.30	17.55	18.20	18.05	17.80	17.20
1988	16.85	16.65	16.55	16.45	16.10	15.80	15.45	15.00	14.50	14.40	13.30	12.50
1989	12.25	12.00	11.25	11.00	10.75	10.45	9.95	9.80	9.80	9.65	**9.55**	

HISTORICAL CONVERSION VALUES

Determined as of the last day of the month indicated ($US/lb U as UF_6)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1981	1.20	1.20	1.20	1.40	1.15	1.15	1.15	1.10	1.10	1.10	1.20	1.20
1982	1.20	1.20	1.20	1.20	1.00	1.00	1.00	0.90	1.10	1.60	1.45	1.45
1983	1.20	1.40	1.40	1.20	1.20	1.20	1.10	1.10	1.00	0.60	0.60	0.60
1984	0.60	0.30	0.80	0.80	0.80	0.00	0.00	0.80	1.00	1.00	0.80	0.80
1985	1.00	1.00	1.00	1.50	1.50	1.60	1.60	1.60	1.60	1.60	1.60	1.60
1986	1.60	1.80	1.90	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.80	1.80
1987	1.80	1.80	1.80	1.80	1.80	1.80	1.90	1.90	1.90	1.90	1.90	1.90
1988	1.90	1.80	1.80	1.80	1.80	1.80	1.85	1.95	1.95	1.95	1.95	1.95
1989	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.90	1.90	1.80	**1.75**	

HISTORICAL SWU VALUES (at 0.30 Percent Tails Assay)

Determined as of the last day of the month indicated ($US per SWU)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	80	80	80	80	75	78	78	78	78	78	80	80
1987	80	80	77	77	75	73	75	75	73	69	73	73
1988	73	73	70	68	68	68	68	65	65	65	65	65
1989	65	67	67	67	66	66	66	65	63	59	**57**	

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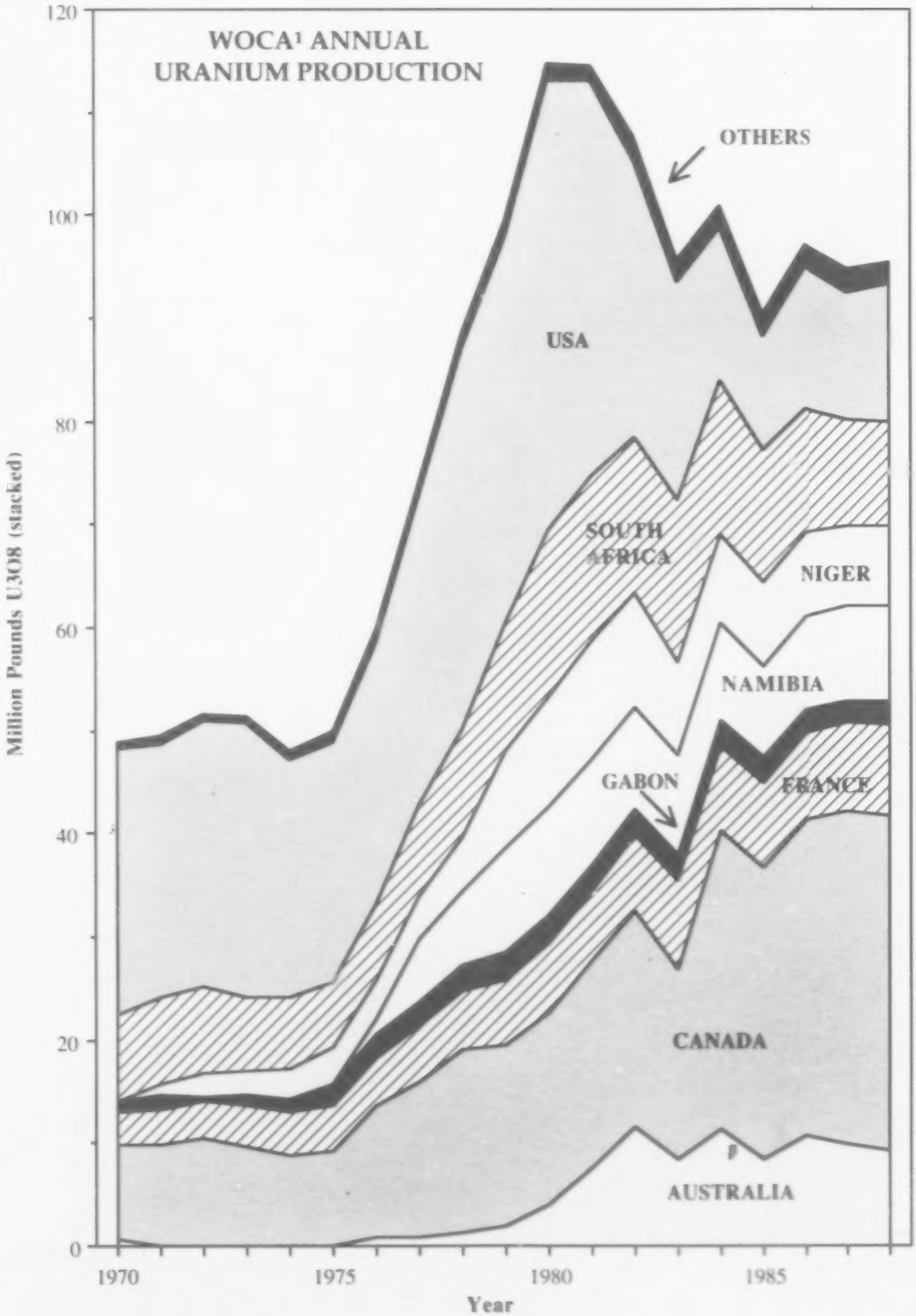
HISTORICAL MARKET DATA



1 WOCA = World Outside of Centrally-Planned Economic Areas.

2 World production in 1988 totalled 96.8 million pounds (Australia—9.3; Canada—32.3; France—8.9; Gabon—2.4; Namibia—9.2; Niger—7.8; South Africa—9.9; USA—13.5; Other—3.5).

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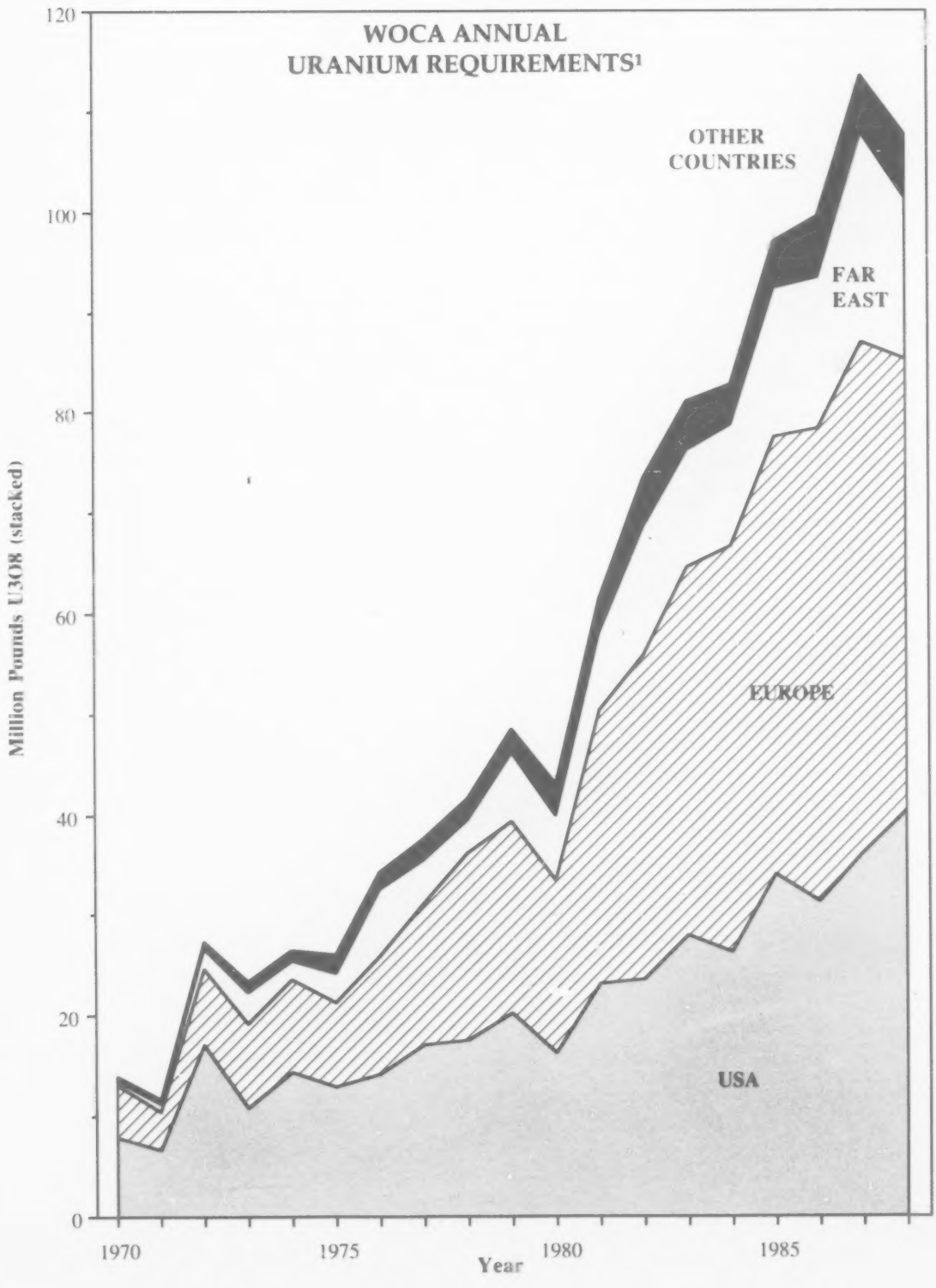

[1] Calculated by NUEXCO based on actual plant completion dates and operating performance, and NUEXCO's estimate of enriching tails assays.

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HISTORICAL MARKET DATA

VOLUME AND PRICE OF URANIUM DELIVERIES TO THE EUROPEAN COMMUNITY[1]
(Compiled from data published by the Euratom Supply Agency)

Year	Volume of Deliveries to the EC[2] (in MTU)	Percentage of Deliveries Made Under Spot Contracts	Medium or Long-Term Contracts[3,4]		Spot Contracts[3,4]	
			Average Price in ECU per pound U_3O_8	Average Price in US Dollars per pound U_3O_8	Average Price in ECU per pound U_3O_8	Average Price in US Dollars per pound U_3O_8
1977	n/a	n/a	n/a	n/a	n/a	$41.00
1978	n/a	n/a	n/a	n/a	n/a	$43.00
1979	10,000	n/a	n/a	n/a	n/a	$44.50
1980	8,600	n/a	n/a	$36.00	n/a	$35.00
1981	13,000	less than 10	n/a	$33.25	n/a	$28.00
1982	12,500	less than 10	ECU 32.25	$32.00	ECU 24.25	$24.00
1983	13,500	less than 10	ECU 34.75	$31.00	ECU 26.00	$23.25
1984	11,000	less than 10	ECU 37.75	$29.75	ECU 24.50	$19.25
1985	11,000	11.5	ECU 38.00	$29.00	ECU 19.50	$15.00
1986	12,000	9.5	ECU 31.50	$31.00	ECU 18.00	$17.75
1987	14,000	17.0	ECU 28.25	$32.50	ECU 15.00	$17.25
1988	12,500	4.5	ECU 26.92	$31.82	ECU 13.65R	$16.13R

R = Revised

[1]The twelve European Community member nations are Belgium, Denmark, France, the Federal Republic of Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and the United Kingdom; prior to January 1986, Spain and Portugal were not members of the EEC.

[2]The only deliveries taken into account are those made to final users, namely the electric utilities or their procurement organizations; deliveries to middlemen or fuel cycle companies are not included. The sales between utilities in the Community are also excluded. The quantities covered are those which were entered into accounting records during the year stated.

[3]For deliveries made under medium or long-term contracts (i.e., for which the time between the date of signature and the date of the last delivery exceeds one year) the prices were expressed in seven different currencies. In order to calculate an average price, these prices have been converted into European Currency Units (ECU) and US dollars. The average prices were weighted by quantity and converted on the basis of the average annual exchange rate of the different currencies against the ECU and US dollar.

[4]Exchange rates are published by European Communities Statistical Office and the International Monetary Fund.

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US URANIUM MARKETING ACTIVITIES STATISTICS
(Compiled from data published by the US Energy Information Administration) [1]

Year	Total Production (million pounds U_3O_8)	Deliveries to Domestic Utilities From US Suppliers[2] (million pounds U_3O_8)	Average Price of Delivered Uranium[2] ($/lb. U_3O_8)	Quantity of Uranium Imported[3] (million pounds U_3O_8)	Average Price of Imported Uranium ($/lb. U_3O_8)	Quantity of Uranium Exported (million pounds U_3O_8)
1976	25.5	27.6	16.10	3.6	n/a	1.2
1977	29.9	27.8	19.75	5.6	n/a	4.0
1978	37.0	31.6	21.60	5.2	n/a	6.8
1979	37.5	33.0	$23.85	3.0	n/a	6.2
1980	43.7	35.0	$28.15	3.6	$43.10	5.8
1981	38.5	32.6	$34.65	6.6	$32.90	4.4
1982	26.9	23.5	$38.37	17.1	$25.19	6.2
1983	21.2	24.2	$38.21	8.2	$26.16	3.3
1984	14.9	22.5	$32.65	12.5	$21.86	2.2
1985	11.3	21.7	$31.43	11.7	$20.08	5.3
1986	13.5	18.9	$30.01	13.5	$20.07	1.6
1987	13.0	20.8	$27.37	14.8	$19.14	1.0
1988	13.1	17.6	$25.65	15.8	$19.03	3.3

[1] Sources: 1976-1983: US Department of Energy/Energy Information Administration, *Survey of United States Marketing Activity*
1984-1988: Energy Information Administration, *Uranium Industry Annual*

[2] Data for 1976-1981 includes both domestic utilities and agents

[3] Includes imports by domestic utilities and domestic suppliers

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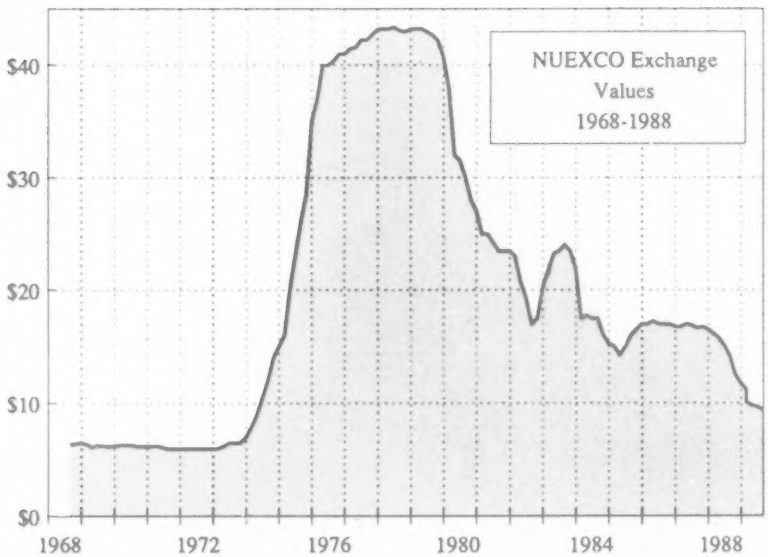
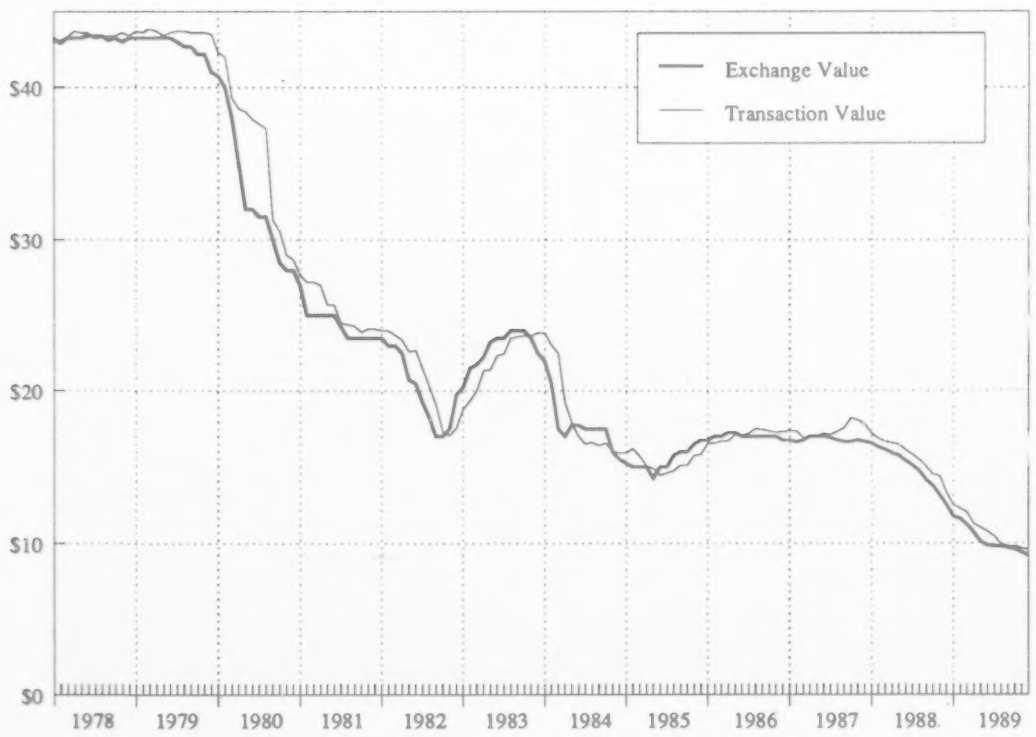
HISTORICAL MARKET DATA

NUEXCO Historical Exchange and Transaction Values

(In US Dollars/Pound U_3O_8)





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AUSTRALIA

		Consumer Price Index[1] (1980/1981 = 100)	Price Index of Materials Used in Manufacturing Industry — All Groups[2] (1984/1985 = 100)	Average Weekly Earnings — Adult Males — Australia (Australian dollars)[6]	Award Rates of Pay Indexes Australia - Adult Males In Mining Wage Earners, Weekly Rates[3] (June 1985=100)
1980	Avg.	95.8	83.1	—	140.8[5]
1981	Avg.	105.0	85.9	—	154.1[5]
1982	Avg.	116.7	89.0	—	174.9[5]
1983	Avg.	128.5	96.9	—	181.9[5]
1984	Avg.	133.6	98.0	—	194.4[5]
1985	Avg.	142.6	107.3	—	103.7
1986	Avg.	155.5	101.5	—	106.1
1987	Avg.	168.7	108.9	465.88	112.3
1988	Avg.	180.9	111.8	496.90	115.2
Jan	1989	—	110.6	—	122.2
Feb	1989	—	111.2	521.90	122.2
Mar	1989	188.1R	114.9	—	123.1
Apr	1989	—	117.5	—	123.2
May	1989	—	118.6	531.50P	123.6
June	1989	192.8	119.9	—	123.6
July	1989	—	120.1	—	123.6
Aug	1989	—	119.2	—	—
Sept	1989	197.2	—	—	—

P = Preliminary **R** = Revised since last month

[1]Weighted average of six State capital cities (1975 to 1980), and eight capital cities from 1981 (Base: Financial year July 1980 to June 1981 =100.0). Figures shown at end of quarter represent quarterly average.
[2]Australian Bureau of Statistics, Canberra: "Price Index of Materials Used in Manufacturing Industry" (Catalogue No. 6411.0).
[3]Australian Bureau of Statistics, Canberra: "Award Rates of Pay Indexes, Australia" (Catalogue No. 6312.0). Figures for the latest fourteen months shown are subject to revision.
[4]Monthly data for the period 1967 to 1986 appear in Report 233.
[5]Base: June 1976 = 100.
[6]Australian Bureau of Statistics, Canberra: "Average Weekly Earnings, States & Australia" (Catalogue No. 6302.0).

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GOVERNMENT STATISTICS

CANADA

		Industrial Products Price Index: All Commodities[1] (1981 = 100)	Consumer Price Index: All Items (1981 = 100)	Wage-earner Data: Average Hourly Earnings (C$)[2] Uranium Mines (SIC 057)	Metal Mines (SIC 051-059)	Mines, Quarries and Oil Wells[3] (SIC 051-099)	Metal Rolling, Casting and Extruding (SIC 298)	Chemicals and Chemical Products Industries (SIC 372-379)
1980	Avg.	90.7	88.9	—	—	—	—	—
1981	Avg.	100.0	100.0	—	—	—	—	—
1982	Avg.	106.7	110.8	—	—	—	—	—
1983	Avg.	110.4	117.2	17.22	—	14.18	10.67	11.10
1984	Avg.	115.4	122.3	17.89	—	14.97	11.11	11.68
1985	Avg.	118.6	127.2	18.53	16.48	15.56	11.85	12.12
1986	Avg.	119.6	132.4	19.38	16.70	15.76	12.28	12.58
1987	Avg.	122.7	138.2	20.12	17.15	16.11	12.58	13.20
1988	Avg.	128.1	143.8	20.91	18.51	16.95	13.17	13.77
Jan	1989	130.7	146.8	21.22	19.45	18.14	13.75	13.82
Feb	1989	130.8	147.8	22.05	19.51	18.26	13.79	13.89
Mar	1989	131.3	148.5	21.90	19.65	18.35	13.62	14.10
Apr	1989	131.3	149.0	22.37	19.80	18.40	13.57	14.16
May	1989	131.4	150.5	21.89	20.02	18.17	13.76	14.27
June	1989	131.4	151.3	21.89	20.02	18.17	13.76	13.22
July	1989	131.3	152.3	21.67	19.60	17.96	13.57	12.98
Aug	1989	131.2	152.4	20.97	19.76R	18.24R	13.52R	14.30R
Sept	1989	130.9	152.6	21.97P	20.60P	18.73P	13.60P	14.82P
Oct	1989	130.8	153.2	—	—	—	—	—

P = Preliminary R = Revised since last month

[1]Statistics Canada, Prices Division, Ottawa: "Industry Price Indexes" (Catalogue 62-011). Indexes for the most recent six months shown are subject to revision. This category was formerly known as "Manufacturing." Monthly data for the period 1967 to 1986 is found in Report 233.
[2]Statistics Canada, Labour Division, Employment and Payrolls Section. Ottawa: "Employment, Earnings and Hours." Monthly data for the period 1983 to 1986 is found in Report 233.
[3]Reports 175 through 185 list this series title incorrectly as "Metal Mining, Including Milling (SIC 050-099)."

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REPUBLIC OF SOUTH AFRICA

		Average Declared Working Costs per Metric Ton of Gold Ore Milled (Rand)[1]	Tonnage-Weighted Index of Average Working Costs per Metric Ton of Gold Ore Milled (March 1982 = 100)[2]	Consumer Price Index[3] (1985 = 100)	Production Price Index All Groups[4] (1980 = 100)	Total Employment in Mining and Quarrying[5]	Total Salaries and Wages in Mining and Quarrying (1,000 Rand)[5]
1980	Avg.	35.53	—	51.9	100.0	709,042	2,237,689
1981	Avg.	41.89	—	59.8	113.6	722,918	2,756,928
1982	Avg.	47.25	104.2	68.6	129.4	702,041	3,181,584
1983	Avg.	51.88	115.0	77.1	143.1	700,901	3,563,282
1984	Avg.	58.95	130.3	86.0	155.1	711,511	4,134,390
1985	Avg.	68.76	151.6	100.0	181.2	724,587	4,778,612
1986	Avg.	80.22	177.9	118.6	216.6	756,637	5,767,950
1987	Avg.	95.01	223.1	137.7	246.8	751,864	6,911,395
1988	Avg.	106.69	241.1	155.4	279.3	705,355	7,774,054
Jan	1989	—	—	166.8	299.8	714,593	704,320
Feb	1989	—	—	168.2	305.4	696,329	669,983
Mar	1989	112.29	262.8	170.9	310.0	702,746	695,843
Apr	1989	—	—	173.1	315.0	658,677	634,344
May	1989	—	—	175.9	319.6	706,056	721,263
June	1989	113.76	267.0	177.7	320.9	706,810	720,586
July	1989	—	—	179.3	324.0	711,648	775,002
Aug	1989	—	—	181.8	327.5R	703,812	793,475
Sept	1989	119.76	280.2	183.4	329.3	—	—
Oct	1989	—	—	185.1	—	—	—

P = Preliminary R = Revised since last month

[1]Chamber of Mines of South Africa, Johannesburg: "Analysis of Working Results," published quarterly. Historical Data by month appears in Report 236.
[2]Page 16 of Report 178 contains description and calculation of index, and page 24 of Report 178 lists figures for 1982.
[3]Central Statistical Service, Pretoria: All income groups-weighted average, Historical Data by month appears in Report 236.
[4]Central Statistical Service, Pretoria: All commodities for consumption in South Africa.
[5]Central Statistical Service, Pretoria: Historical Data by month appears in Report 236.

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GOVERNMENT STATISTICS

UNITED STATES

		Producer Price Index[1]		Consumer Price	GNP Implicit Price	Gross Average Hourly Earnings of Production or Non-supervisory Workers (US$)[4]			
		Industrial Commodities (1982 = 100)	All Commodities (1982 = 100)	Index[2] (1982-1984 = 100)	Deflator[3] (1982 = 100)	Metal Mining (SIC 10)	Primary Non-ferrous Metals (SIC 333)	Chemicals and Allied Products (SIC 28)	Electric and Electronic Equipment (SIC 36)
1980	Avg.	88.0	89.8	82.4	85.7	10.26	10.63	8.30	6.94
1981	Avg.	97.4	98.0	90.9	94.0	11.55	11.98	9.12	7.62
1982	Avg.	100.0	100.0	96.5	100.0	12.31	12.93	9.96	8.21
1983	Avg.	101.1	101.3	99.6	103.9	12.58	13.43	10.58	8.67
1984	Avg.	103.3	103.7	103.9	107.7	13.05	13.43	11.07	9.04
1985	Avg.	103.7	103.2	107.6	110.9	13.38	13.74	11.56	9.46
1986	Avg.	100.0	100.2	109.6	113.9	12.46	13.48	11.98	9.65
1987	Avg.	102.6	102.8	113.6	117.7	12.52	12.98	12.37	9.88
1988	Avg.	106.3	106.9	118.3	121.7	13.09	13.22	12.67	10.13
Jan	1989	109.4	110.5	121.1	—	13.80	13.49	12.85	10.27
Feb	1989	110.1	110.8	121.6	—	13.66	13.48	12.88	10.26
Mar	1989	110.5	111.5	122.3	125.4	13.71	13.51	12.91	10.30
Apr	1989	111.8	112.3	123.1	—	13.68	13.65	12.92	10.31
May	1989	112.1	113.2	123.8	—	13.60	13.57	12.98	10.33
June	1989	112.4R	112.9R	124.1	126.0	13.62	13.66	12.98	10.37
July	1989	112.2	112.7	124.4	—	13.70	13.75	13.12	10.41
Aug	1989	111.4	112.0	124.6	—	13.64R	13.72	13.08R	10.40R
Sept	1989	111.9	112.3	125.0	126.8	13.72P	13.85P	13.18R	10.48R
Oct	1989	112.4	112.7	125.6	—	—	—	13.21P	10.47P

P = Preliminary **R** = Revised since last month

[1]US Bureau of Labor Statistics, Washington, D.C.: "Producer Prices and Price Indexes," (formerly "Wholesale Prices and Price Indexes"). Producer Price Indexes are revised four months after they are first released to reflect the availability of late reports and corrections by respondents. Historical data is presented in Report 233.

[2]US Bureau of Labor Statistics, Washington, D.C.: Consumer Price Index for All Urban Consumers, US City Average, All Items. Historical data is presented in Report 233.

[3]US Department of Commerce, Washington, D.C.: Bureau of Economic Analysis, National Income and Wealth Division: "Survey of Current Business." The GNP Implicit Price Deflator is published quarterly, and seasonally adjusted. Historical data is presented in Report 233.

[4]US Bureau of Labor Statistics, Washington, D.C.: "Employment and Earnings." All data based on 1972 revision of SIC Manual. Historical data is presented in Report 233.

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Nuclear Industry Calendar

1990	
Jan. 22-26	***Nuclear Fuel Cycle Committee*** (Las Vegas, Nevada), sponsored by the American Society for Testing and Materials. Contact Ms. Katharine Schaaf at the ASTM at 1-215-299-5529.
Mar. 4-8	***7th Pacific Basin Conference*** (Sheraton Harbor Island Hotel, San Diego, California), sponsored by the ANS. Contact the ANS Meeetings Department at 1-312-352-6611.
Mar. 25-28	***Fuel Cycle '90 Conference*** (Opryland Hotel, Nashville, Tennessee), sponsored by the US Council for Energy Awareness. Contact the USCEA Conference Office at 1-202-293-0770.
Apr. 8–12	***First Annual International High-Level Radioactive Waste Management Conference*** (Caesar's Palace Hotel, Las Vegas, Nevada), sponsored by the American Nuclear Society and American Society of Civil Engineers. Contact the ANS at Meeetings Department at 1-312-352-6611.
Apr. 9-11	***23rd JAIF Annual Conference*** (Kyoto, Japan). Contact Ms. Sachie Sugoh, Dept. of Planning and International Affairs, JAIF, at 03-508-9056.
Apr. 22-25	***INFO '90*** (Westin Hotel, Dallas, Texas), sponsored by the USCEA. Contact the USCEA Conference Office at 1-202-293-0770.
Sept. 5-7	***Uranium Institute 15th Annual Symposium*** (London, United Kingdom). Contact the UI at 44-1-225-0308.
Sept. 16-19	***Uranium Seminar '90*** (Hyatt Regency, San Antonio, Texas), sponsored by the USCEA. Contact the USCEA Conference Office at 1-202-293-0770.
Nov. 11-14	***Nuclear Energy Forum*** (Washington Hilton, Washington, D.C.), sponsored by the USCEA and ANS. Contact the USCEA Conference Office at 1-202-293-0770, or the ANS Meetings Department at 1-312-352-6611.

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Canada

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USA

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USA

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South Africa

Lars Halle
Sweden

James C.C. Stewart
United Kingdom

REPRESENTATIVES

AUSTRALIA:

James G. Munro
7 Nevada Street
North Balwyn, Victoria 3104
Australia
Telephone: (61-3) 857-6823
Telecopy: (61-3) 857-8258

JAPAN:

Kazuo Yokota
Japan Tech Services
Ohkura Building (3F)
1–4–10 Shiba Daimon
Minato-ku, Tokyo, Japan
Telephone: (81-3) 431-6031, 6025
Telecopy: (81-3) 434-6674
Telex: 242-5060 (JATECH J)

SOUTH AFRICA:

Chris I. Von Christierson
Southern Prospecting (Pty) Limited
Mailing Address:
Post Office Box 61409
Marshalltown 2107
Republic of South Africa
Street Address:
7th Floor, Marshall Place
66 Marshall Street
Johannesburg 2001
Telephone: (27-11) 834-4211
Telecopy: (27-11) 834-6343
Telex: 4-89878-SA

TAIWAN:

Dr. Steve H.K. Wang
Southeast Engineering Corporation
Yu-Ming Mansion
7, Roosevelt Rd., Sec. 1, 7th Floor
Taipei, 10757, Taiwan R.O.C.
Telephone: (886-2) 321-0216
Telecopy: (886-2) 394-2621
Telex: 11285 (SENCORP)

UNITED STATES:

Harold C. Lindberg
83-A Hardee Lane
Whispering Pines, North Carolina 28327
Telephone: (919) 949-3622
Telecopy: (919) 949-2626

Ralph O. Smith
141 Braemar Drive
Cheshire, Connecticut 06410
Telephone: (203) 272-6246
Telecopy: (203) 271-1346

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INTERNATIONAL HEADQUARTERS

Three Park Central, Suite 900
1515 Arapahoe Street
Denver, Colorado 80202

Telephone: (303) 899-4500
Telecopy: (303) 899-4555
Telex: 450202/NUEXCO